A review of health management for stroke survivors during the rehabilitation period

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ABSTRACT

Background: Stroke is a prevalent acute cerebrovascular disorder, After the patient falls ill, it seriously affects their physical and mental health, bringing a heavy burden of care, rehabilitation, and finances to their families. Health management is a management model proposed to prevent and control the occurrence and development of diseases, which is considered an effective means to help stroke patients maintain their health to the maximum extent possible. This study aims to examine the current health management models employed during the rehabilitation period of stroke patients, identify shortcomings in these models, and propose strategies for optimizing the health management and maintenance of patients' health throughout the rehabilitation process. **Methods:** The relevant literature on health management models in the rehabilitation period of stroke was searched on Cochrane Library, PubMed, Embase, Scopus, Web of Science, CNKI, and WanFang Data systems, and the search time was up to May 2024. Extract and summarize the literature content. **Results:** For stroke rehabilitation patients, the health management model is in the exploratory stage, with limited content and single intervention methods. A systematic and multi-level health management model has not yet been formed. The health management model does not really connect hospitals, communities, families, and individuals effectively, and the advantages of medical resources and multidisciplinary teams in health management have not been truly reflected. **Conclusion:** The study shows that the existing health management model should be further improved, including the use of telemedicine technology, strengthening the guidance of hospitals to rehabilitation centers and communities. Government departments need to introduce corresponding policy guarantee mechanisms, give full play to the collaborative power of multidisciplinary teams in hospitals and communities, and improve the effectiveness of health management for stroke patients.

Keywords: Stroke; Rehabilitation period; Health management: Review

1. INTRODUCTION

Stroke is one of the most prevalent acute cerebrovascular diseases, exhibiting several major characteristics, including high morbidity, mortality, disability, recurrence, and an economic burden. Stroke has become the second principal cause of mortality globally, accounting for 11.6% of total deaths, and the third leading cause of mortality and disability-adjusted life years (DALYs) globally, accounting for 5.7% of total DALYs worldwide (Collaborators, 2021). According to WHO statistics (Organization, 2020, 2021), stroke is the number one cause of disease-related deaths and DALYs in China. The patient's illness seriously affects his/her physical and mental health, and brings a heavy burden of care, rehabilitation, and economy to his/her family, which seriously jeopardizes the health of the nation, and affects the quality of the patient's survival and the family's quality of life. Effective rehabilitation activities after stroke can help patients establish correct role behaviors, and maintain or improve physical functions, thus reducing the degree of disability and improving the quality of life. The joint American Heart Association/American Stroke Association (AHA/ASA) "2021 Guideline for the Prevention of Stroke in Patients with Stroke and Transient Ischemic Attack" (Kleindorfer et al., 2021) states that

"The risk of stroke recurrence in patients with stroke and TIA (Transient ischemia attack) can be reduced by up to 80% through the management of stroke risk factors, including lifestyle, such as dietary and exercise modifications, and the use of glucose-, lipid-, and blood pressure-lowering medications."

Health management is a management model proposed to prevent and control the occurrence and development of diseases, and it is considered an effective means to help stroke patients maximize their health (Ye & Zhou, 2020). In recent years, with the increase of research on the health management of stroke, the health management models have also shown a diversified development trend. This study aims to evaluate the implementation of health management models in the rehabilitation phase of stroke. The aim is to provide a reference for the better implementation of health management for stroke patients in the rehabilitation period.

2. METHODS

The relevant literature on health management models in the rehabilitation period of stroke was searched on Cochrane Library, PubMed, Embase, Scopus, Web of Science, CNKI, and WanFang Data systems, and the search time was up to May 2024. Extract and summarize the literature content.

3. RESULTS

3.1 Needs of health management during the stroke rehabilitation period

Stroke is frequently linked with complications such as fatigue, varying degrees of impaired limb movement, and unclear speech (Zhu, Di, Ji, Yuan, & Chen, 2022), Additionally, patients frequently experience chronic emotional distress, including depression. Furthermore, anxiety and post-traumatic stress are also prevalent in this population (McCurley et al., 2019). The burden of care borne by family members of stroke survivors is considerable, leading to instability in their lives and a reduction in their well-being and health. The role of the family carer entails the responsibility of attending to all familial events and making all decisions independently. The love expressed by family members who have experienced a stroke is often accompanied by a range of complex emotions, including feelings of sadness, anger, sensitivity,

and depression. Such a perspective may impede the ability to perceive the potential for improvement, leading to uncertainty regarding the future. A common challenge among family caregivers is a lack of understanding and support from external sources. This can contribute to feelings of isolation and exhaustion (Lu, Mårtensson, Zhao, & Johansson, 2019). The illness not only brings a great blow to the patient but also brings a heavy financial, rehabilitation, and caregiving burden to the family. Therefore, more attention should be paid to strengthening the work of health education and disease rehabilitation learning for stroke patients, timely intervention and prevention (Zhou & Tang, 2019), to promote the recovery of patients, to reduce their psychological stress, to improve their desire to participate in the community, so that they can live with self-confidence and dignity, and thus improve the quality of patient's survival, thus obtaining more social support. The theory and practice of health management originated in the United States in the late 1920s, It refers to a series of activities that comprehensively detect, analyze, and assess an individual or a group, provide health advice and guidance, and formulate intervention strategies to manage health risk factors in order to maximize the health of patients (Swarthout & Bishop, 2017). In the process of exploring and practicing health management, a systematic health management model has been developed to maximize health benefits using limited resources.

3.2 Health Management Model of stroke during the rehabilitation period
3.2.1 Hospital rehabilitation stage
In contrast to the conventional physician-led approach to early rehabilitation, hospital-based rehabilitation has now evolved into an interdisciplinary management model. This approach is exemplified by a hospital in the United States that employs an interdisciplinary health management team for the routine management of patients presenting with a stroke or transient ischemic attack. The team, comprising advanced practice nurses and resident physicians, demonstrated that patients managed under this collaborative care model exhibited superior outcomes compared to those managed under traditional resident-led routine care groups. Specifically, patients who were managed under the aforementioned model demonstrated superior outcomes with respect to one of five fundamental stroke-specific quality measures, as well as with regard to two of three patient care experiences (Wood, 2016). Ji et al. (2022) improved disease management in young and middle-aged first-ever Stroke survivors by forming a management team including stroke center physicians, physiotherapists, brain and heart health managers, nurses, psychotherapists, and dietitians, adopting a team-based resource management model, and relying on a whole-process intelligent information platform to implement multidisciplinary members' online and offline interactions with patients and families, management of medication, diet, daily living, emotions, social function and interpersonal management, rehabilitation and exercise, and other aspects of self-management ability of young and middle-aged first-episode stroke survivors. A network meta-analysis showed that coordinated multidisciplinary care was provided by a multidisciplinary team to stroke patients in stroke wards to manage common post-stroke problems. Stroke patients who received care were more likely to be alive one year after their stroke, to be independent and to be living at home (Langhorne, Ramachandra, & Stroke Unit Trialists, 2020).

3.2.2 Transitional care phase

The Stroke Health Management Model emphasizes the importance of a seamless transition of care from acute care to rehabilitation and community settings. Research has focused on care coordination strategies such as the use of care pathways, care meetings, and transitional care plans to improve continuity of care and prevent avoidable readmissions. In Italy, a project known as the Look After Yourself (LAY) intervention was carried out to facilitate self-management in the early stages of stroke rehabilitation (Fugazzaro et al., 2021). The program is patient-centered and designed to help stroke survivors self-manage early rehabilitation in hospitals. It enables patients to use action plans to actively set goals, solve problems, and make the critical transition from the hospital to the community easier. The program includes group sessions that facilitate sharing of experiences, social comparison, alternative learning, and increased motivation, as well as one-to-one sessions that focus on the development of action plans and the teaching of individualized fall prevention strategies. It has demonstrated improvements in self-efficacy, mental health, and activities of daily living. The development by US academics of the Comprehensive Post-Acute Stroke Management Service (Lutz et al., 2020), a model that uses an app to capture self-reported assessments of functioning and influencing factors of health from older stroke patients and family caregivers, and builds personalized care plans through embedded algorithms that guide patients to self-manage and participate in shared decision-making, ultimately optimizing the management of stroke risk factors. To provide early support and transitional care for elderly stroke patients returning to the community after hospital discharge, and to meet the complex needs of patients and their carers from a multidimensional physical, psychological, and social perspective.

3.2.3 Community-based Rehabilitation
3.2.3.1 Self-management phase

Self-management is defined as: "The strategies that individuals use to manage their health and well-being. These strategies include the actions that individuals take to: (1) live a healthy life, (2) meet their socio-emotional and behavioral needs, (3) care for them, and (4) avoid future disease (McLean et al., 2016). To facilitate the development of self-management in stroke patients, researchers have developed stroke self-management interventions based on different theoretical frameworks. A randomized controlled trial of a nurse-led stroke self-management program (SESSMP) based on Bandura's self-efficacy theory was conducted by Suzanne H S Lo et al. Results showed that the stroke self-management program improved survivors' self-efficacy, anticipated outcomes, and satisfaction with self-management behaviors (Lo, Chang, & Chau, 2018). A self-management program for stroke survivors was found to enhance patients' perceptions of occupational performance and satisfaction, with self-efficacy acting as a mediating variable for improved occupational performance (Nott et al., 2021). Sajatovic et al. (2018) designed a self-management program based on social-cognitive theory entitled Targeted Management Intervention (TEAM) self-management program to reduce the risk of stroke in African American men, they conducted a six-month prospective randomized controlled trial comparing the Targeted Management Intervention (TEAM) with treatment as usual (TAU) and found that the TEAM program improved patient knowledge of disease risk factors and had a positive impact on patient performance in controlling hypertension, better systolic and diastolic blood pressure and HDL cholesterol. Scholars in Hong Kong, China, developed a nurse-led self-management model for elderly stroke patients based on the health empowerment theory (Sit et al., 2018) ,i.e., a support group consisting of elderly stroke patients,

who implemented their personal goal plans at home along with telephone follow-up by nurses to provide strategies, steps, and guidance for the concrete implementation of the patient's self-management behaviors at home, and the results showed that the model could effectively enhance The results showed that this model can effectively improve patients' internal resources such as self-efficacy and social resources such as supportive nurse-patient relationships, and improve patients' self-management behaviors towards illness and healthy lifestyles. Fu et al. (2020) conducted a novel, community-based, self-directed rehabilitation intervention for community-based stroke patients in New Zealand called 'Take Charge' based on self-determination theory to help stroke patients take charge of their recovery. This low-cost, person-centered, self-directed post-stroke rehabilitation intervention has been shown to be effective in improving patients' health-related quality of life and independence.

These studies have focused on community and home-based rehabilitation management after stroke, covering a variety of medical, role, emotional, and physical functioning components. The most common form of intervention is the conference intervention, which includes video education, videos of peer support experiences, group meetings, and exercise sessions, which focuses on facilitating decision-making, goal-setting, problem-solving, and planning, as well as information and resource support, etc., and patients are often encouraged to use a "workbook" approach to record and provide feedback, demonstrating the positive effects of self-management programs on improving self-efficacy, quality of life, mood, and social participation. A meta-analysis of existing research demonstrated the potential efficacy of theory-based self-management interventions in improving the prognosis of stroke survivors (Lau et al., 2022).

3.2.3.2 Remote health management

The accelerated evolution of contemporary technology has opened up new avenues for the management of stroke patients' health. The increasing prevalence of mobile phones and personal computers/tablets can be leveraged as a valuable resource for facilitating lifestyle changes and disease management. The application of information technology in the form of telemedicine has facilitated greater accessibility to acute care for a broader patient population (Sharrief et al., 2023). Stroke is the principal cause of severe, long-term disability in the United States. The impediments to rehabilitation encompass financial constraints, logistical challenges related to transportation, and a dearth of adequately trained personnel and requisite equipment. Tele-rehabilitation (TR) is a form of rehabilitation support that reduces healthcare costs, is highly feasible, and maintains patient independence. TR is not only less costly in terms of improving functional outcomes for stroke patients, but also has the same intervention effects and patient satisfaction as clinical rehabilitation. Furthermore, TR can be utilized in conjunction with other therapeutic modalities, including VR, voice assistance and robotic support, or as an adjunct to direct in-person healthcare. (Knepley et al., 2021). A study of an enhanced community-based telerehabilitation intervention was conducted in New Zealand. The intervention was a structured six-month program devised by a team of clinicians and researchers specializing in neurorehabilitation. It combined face-to-face meetings, telephone communication, and text message prompts to facilitate continued participation in rehabilitation exercises among the study participants. Each participant received four face-to-face visits, five structured phone calls, and personalized text messages. The results of the trial indicate that remote interventions utilizing information technology can enhance physical function or prevent

reduced mobility following rehabilitation discharge (Saywell et al., 2021). A related systematic review. The aforementioned study indicates that telerehabilitation can enhance accessibility to services for individuals residing in under-resourced regions. Furthermore, it posits that mobile phones represent a viable, cost-effective approach to rehabilitation delivery (Sarfo, Ulasavets, Opare-Sem, & Ovbiagele, 2018). In response to poor blood pressure control after a stroke, Naqvi et al. (2022) tested the feasibility of TASC (post-stroke telehealth care), which consists of a tablet and monitor for the wireless transmission of blood pressure data to an electronic health record and provides telecare support, including remote monitoring of blood pressure in the home supported by nurses, customized infographics and multidisciplinary team video visits. The findings indicated that the provision of enhanced post-acute stroke care through the utilization of home blood pressure telemonitoring represents a viable strategy for the improvement of hypertension in settings where healthcare resources are limited. Ao et al. (2021) applied "Internet + nursing service" to the home rehabilitation of stroke patients, which allowed nursing services to be extended from the hospital to the home, improved patient prognosis, and enhanced limb motor function and daily activity ability during rehabilitation.

As an effective and economical method of delivering and accessing quality healthcare, telemedicine technology is increasingly being adopted and implemented. This allows for better access to care, convenience, and reduced stress, which can also improve patient satisfaction. Nevertheless, the extensive implementation of telemedicine continues to be hindered by a number of obstacles, including the absence of technological resources for telemedicine utilization among the elderly and the constraints imposed by limited internet bandwidth speeds in rural or other regions (Gajarawala & Pelkowski, 2021). English et al. (2022) suggested that although the evidence for using telemedicine to provide stroke rehabilitation interventions is not strong, we cannot wait for stronger evidence. Rather, the best telemedicine solutions that provide the highest quality rehabilitation possible should be investigated.

3.3 Problems and Prospects of Health Management in the Rehabilitation Period of Stroke Patients

3.3.1 A systematic multi-level health management model has yet to be formed

The construction of a three-level rehabilitation network, i.e., early rehabilitation in acute hospitals, secondary rehabilitation in rehabilitation centers, and tertiary rehabilitation in the community or at home, will be the development trend of stroke treatment in the future, and some developed countries in the West have already set up a perfect three-level rehabilitation system for stroke, i.e., patients with stroke who are still suffering from dysfunctionality after treatment in hospitals can be transferred to rehabilitation centers or continue their rehabilitation treatment in the community. At present, Tertiary rehabilitation interventions for stroke in developing countries are still in their infancy. Due to the lack of professional guidance, community and family rehabilitation training has become the weak link in the three-level rehabilitation system. Because of this, in the future, with the help of modern information technology, the use of telemedicine technology, to strengthen the strengthening of hospital rehabilitation centers and community guidance, especially in rehabilitation treatment, telemedicine network coverage requirements are high, economically underdeveloped areas cannot enjoy the service, the country should increase the construction of intelligent equipment for rural health care investment, to solve the problems related to infrastructure, access and data security.

3.3.2 Effective linkages between hospitals, communities, families and individuals not yet established

Most of the hospitals have carried out relevant education, but the form and content is relatively single, the problems faced by patients after discharge and cannot give good personalized guidance advice; community although the establishment of the patient's health file, the patient has no specific rehabilitation guidance, did not really play its corresponding functions, and most of the patients did not participate in the community's health management; the family patients with a weak sense of self-management of the disease, cannot fully mobilize their own initiative, and most patients did not participate in the community's health management; family awareness of disease self-management, cannot Fully mobilize their own initiative, family members to bear the burden of care for a long time, will not release, will exacerbate the anxiety of stroke patients and other adverse emotions. In the future, it is necessary for governmental departments to introduce corresponding policies and guarantee mechanisms, guide hospitals, communities, and families to establish close links, and give full play to the collaborative power of multidisciplinary teams in hospitals and communities, so as to improve the effectiveness of health management of stroke patients, improve the quality of life of stroke patients, and prevent the occurrence of secondary strokes.

4. CONCLUSION

The existing health management model should be further improved, including the use of telemedicine technology, and strengthening the guidance of hospitals to rehabilitation centers and communities, especially in rehabilitation treatment. Investment in the construction of intelligent medical equipment in rural areas should be increased to address issues related to infrastructure, access, and data security. Government departments need to introduce corresponding policy guarantee mechanisms, give full play to the collaborative power of multidisciplinary teams in hospitals and communities, and improve the effectiveness of health management for stroke patients.

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