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Continuity of Care Needs for Home-Based Rehabilitation in Elderly Stroke Patients: A Qualitative Study

Huang Weizhi

Putian Children's Hospital, Putian, China

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Abstract: Home-based rehabilitation for elderly and frail stroke patients has become an important research area in modern medicine. With the intensifying trend of global population aging, the incidence of stroke among elderly and frail patients is on the rise. Traditional hospital-based rehabilitation models face issues such as high costs and insufficient resources. Home-based rehabilitation, being a more cost-effective alternative, is gradually gaining attention. This study explores the continuity care needs of home-based rehabilitation for elderly and frail stroke patients through qualitative interviews. The findings reveal that the core needs of patients and their families include five themes: demand for professional nursing resources, personalized home-based rehabilitation, prevention and emergency response to complications, support for family caregivers' skill enhancement, and psychological and social support networks. It emphasizes achieving service continuity and risk control through telemedicine coverage, tiered training for family members, multidisciplinary team collaboration, and the application of intelligent monitoring tools.

1. Introduction

In the context of accelerating global population aging, the number of elderly patients with frailty and stroke continues to grow. According to data from the World Health Organization, stroke has risen to become the second leading cause of death globally, particularly among the elderly, where its mortality and disability rates are even more pronounced [1]. The sequelae caused by stroke severely erode the quality of life for patients, and elderly frailty patients, who experience decline in physical strength, cognitive ability, and mental state, often suffer from symptoms such as physical weakness, unsteady gait, and cognitive impairment. This makes their rehabilitation process more complex and prolonged compared to that of general patients.

Despite the significant improvement in stroke treatment through modern medical technology, residual effects remain a critical factor limiting patients' quality of life. Elderly and frail stroke patients face more physiological and psychological challenges during rehabilitation, urgently requiring comprehensive and long-term rehabilitation interventions[2]. While traditional hospital-based rehabilitation models have professional advantages, they come with high medical costs, prolonged hospital stays that increase physical and mental burdens, and strained medical resources. In contrast, home-based rehabilitation, which reduces economic costs, provides personalized care, and leverages familiar environments to promote recovery, has become a widely

recognized alternative.

However, as the core care model bridging hospitals and homes, continuity of care lacks specific studies targeting elderly frail stroke patients in terms of needs assessment. This group, characterized by decreased physiological reserves, multiple medications, and a fragile social support system, urgently requires further exploration of their continuity of care needs. The aim of this study is to focus on the continuity of care needs of elderly frail stroke patients and their families during the home rehabilitation phase, providing a scientific basis for optimizing rehabilitation care strategies for this special group.

2. Research Methods

The study employed a qualitative phenomenological approach [3] to conduct a detailed exploration of the continuity of care needs for home-based rehabilitation in elderly frail stroke patients after discharge. The research subjects were recruited through purposive sampling, with participants invited face-to-face from the neurology department of a tertiary hospital. The department was responsible for providing continuity of care. Semi-structured interviews were conducted between July and August 2024. Inclusion criteria for elderly frail stroke patients: individuals who have experienced at least one stroke and are aged 60 or older, accompanied by symptoms of frailty. For family caregivers, inclusion criteria required that they primarily take care of family members affected by the stroke. Exclusion criteria applied to stroke patients and their family caregivers who exhibited severe cognitive impairment, aphasia, or inability to communicate normally.

3. Data acquisition

The interviews were conducted by two female graduate students in nursing with qualitative research experience, who had undergone training in standardized qualitative research methods. The interviews followed a semi-structured interview guide, which was developed by the research team after reviewing relevant literature and consulting experts in stroke rehabilitation and qualitative research, aligning with the research objectives. The interview took place in the outpatient consultation room of the neurology department to ensure privacy and minimize interference. Before the interview, participants were informed of the research purpose, data anonymity, and confidentiality, and they signed an informed consent form. With their consent, the interviews were recorded and noted on-site. The order of questions was adjusted flexibly based on the participants' responses to clarify viewpoints and facilitate deeper discussions. Each interview lasted between 30 to 90 minutes. After the interviews, participants received a thank-you letter and a small gift worth 10 yuan.

4. Data analysis

This study employs the inductive thematic analysis method [4], strictly adhering to the following six steps: First, Mandarin audio recordings are transcribed into text via Baidu Netdisk, while local dialect audio recordings are manually translated into text. The transcribed texts are then imported into NVivo 14 for analysis. Two researchers independently review the transcribed texts multiple times to familiarize themselves with the data. Next, using NVivo software, they independently generate initial codes to accurately capture key information. After completing the initial coding, any conflicting parts are discussed and resolved by the two researchers. In the third step, similar codes are categorized into potential themes to ensure that the themes accurately reflect the data content. The fourth step involves a rigorous review and refinement of the themes through team discussions

and comparisons with the original data, ensuring the coherence, consistency, and distinctiveness of the themes. In the fifth step, researchers collaborate to define and name each theme, making them clear and easy to understand. Finally, a research report is written based on the identified themes, presenting the findings and conclusions. The entire process continues until data saturation is achieved, meaning no new themes emerge, while strictly adhering to the comprehensive standards for qualitative research reports (COREQ).

5. Moral considerations

Before each interview began, participants were provided with detailed explanations of the research objectives and methods. Participants gave their informed consent. The researchers emphasized that all recorded data and personal information would be used exclusively for the purpose of this study and maintained with the highest level of confidentiality. To ensure this confidentiality, stroke patients were referred to numbers P1-P5, and family caregivers were referred to numbers F1-F8. Additionally, participants retained the freedom to stop participating in interviews or decide whether to continue at any time. There were no prior relationships or conflicts of interest between the researchers and the participants.

6. Results

6.1 General information

Table 1: Demographic and Clinical Characteristics of Troke patients (n=5)

feature		N	%
age	60-70	1	20.00
	70-80	2	40.00
	≥80	2	40.00
sex	the male sex	3	60.00
	femininity	2	40.00
Residence	living alone	1	20.00
	Live with a spouse	2	40.00
	Live with your children	2	40.00

Table 2: Demographic and Clinical Characteristics of Family Caregivers (n = 8)

feature		N	%
age	<60	3	37.50
	60-70	2	25.00
	70-80	2	25.00
	≥80	1	12.50
sex	the male sex	4	50.00
	femininity	4	50.00
Length of care (months)	<6	2	25.00
	6-12	2	25.00
	13-24	2	25.00
	>24	2	25.00

A total of 13 participants were recruited through face-to-face invitations, including 5 stroke patients and 8 family caregivers. Among the stroke patients, there was 1 person aged 60-70,2 people aged 71-80, and 2 people aged 80 and above, with 3 being male. In terms of living arrangements, 1

person lived alone, 2 people lived with their spouse, and 2 people lived with their children. For family caregivers, there were 3 people under 60,2 people aged 60-70,2 people aged 71-80, and 1 person over 80, with 50.00% being male and 50.00% female. During the study, all participants completed interviews without any dropouts or non-response issues. The sociodemographic information of the stroke patients and family caregivers is shown in Table 1 and Table 2, respectively.

6.2 The need for home-based rehabilitation and continuity of care for elderly patients with frail stroke

Participants had extensive discussions on the content of continuity care needs for home-based rehabilitation after discharge for elderly frail stroke patients. A total of five themes were identified, including (the need for specialized nursing resources, the need for personalized home-based rehabilitation, the need for complication prevention and emergency response, the need to enhance and support family caregiving capabilities, and the need for psychological and social support networks), along with 14 codes from semi-structured interviews. Table 3 reports the detailed themes and codes for elderly frail stroke patients and family caregivers.

Table 3: Themes and Subthemes

theme	sub-theme
Demand for professional care resources	There is a shortage of professional nursing staff
	The coverage and connection of continuous nursing services are insufficient
	Telecare technology is not widely available
The need for personalized home rehabilitation	Arrangements for personalized rehabilitation programs
	The need for multidisciplinary collaboration
	The need for information-based home rehabilitation
The need for prevention and emergency response of complications	There is no active risk assessment and early warning
	The need for first aid skills training
The need for enhanced and supported family care	Demand for family care knowledge and skills training
	The channel of obtaining nursing information is not clear
	Caregiving is stressful and there is a need for psychological support
Psychological and social support network needs	Targeted intervention needs for patients' psychological rehabilitation
	Demand for social resources and policy support
	The need for home environment adaptation to aging

6.2.1 Demand for professional nursing resources

6.2.1.1 Insufficient professional nursing staff

Although the hospital provides telephone follow-ups, the staff cannot assess the patient's condition and do not offer home care services, making it inconvenient to consult about health issues. There is also a lack of intelligent equipment to assist in monitoring the patient's condition. "We live in the mountains, where transportation is very inconvenient. We can't even hire doctors, nurses, or rehabilitation therapists to come to our home; we have to learn from online videos ourselves, but we always fear making mistakes. Last time, my father fell while practicing walking and his leg swelled

for several days... If there were professional personnel available when needed, or if they could visit once a week, that would be great." (F1)

6.2.1.2 The coverage and connection of continuous nursing services are insufficient

The coverage of nursing services is limited and the integration is insufficient, especially in primary healthcare facilities and remote areas, where patients find it difficult to obtain comprehensive care support from admission to post-discharge rehabilitation. "When discharged, the doctor said to take medication on time and adjust it regularly, but after returning home, I couldn't find anyone to help me. When my blood pressure spiked, I didn't know who to ask, and in the end, I had to rush to the emergency room, which was quite troublesome." (P1)

6.2.1.3 The popularization of remote nursing technology is not enough

The forms and technologies of nursing support continue to improve, but the popularization of telemedicine is constrained by various factors, including technical equipment, health insurance policies, and imbalances in medical resources. "If we could contact doctors and nurses anytime with our phones, or have a device to monitor my mother's blood pressure and gait, we wouldn't be constantly worried about her falling." (F2)

6.2.2 The need for personalized home rehabilitation

6.2.2.1 Arrangement of personalized rehabilitation plan

Stroke patients 'home rehabilitation plans are mostly standardized, lacking personalized arrangements. "The rehabilitation plan given by the hospital is all about' lifting legs 50 times a day, 'but my mom's joints hurt so much she can't do it at all. If the plan could be adjusted according to her condition, for example, to sit-up exercises, it might be more effective." (F3)

6.2.2.2 Requirements for multidisciplinary collaboration implementation

Interdisciplinary collaboration in the medical field has significant implementation needs, capable of significantly improving medical quality and efficiency, enhancing patient experience and satisfaction. However, many challenges arise during its implementation, making it difficult to put into practice. "The nutritionist says a low-salt diet is necessary, but the rehabilitation therapist insists on protein supplementation; we don't know who to listen to... It would be great if doctors, nurses, and nutritionists could discuss and agree on a plan together." (F4)

6.2.2.3 Demand for home-based rehabilitation through information technology

Currently, home rehabilitation care mainly focuses on traditional products such as rehabilitation beds, wheelchairs, crutches, and walkers for exercise. However, there are still many constraints in the field of smart rehabilitation care. "I used an APP to track my steps, but the doctor couldn't see the data at all. If it could automatically sync with the hospital, they could also guide me to adjust my training volume in a timely manner." (P2)

6.2.3 Requirements for prevention and emergency response of complications

6.2.3.1 No active risk assessment and early warning

Currently, most home rehabilitation tools focus on rehabilitation training and health monitoring, but they are quite weak in risk assessment and early warning during the rehabilitation process. "We

don't even know when we fell, and no one answers our calls. After searching high and low, we finally found it behind a rock. If there had been an early warning device, we wouldn't have missed the time for thrombolysis, which would have improved the prognosis." (F4)

6.2.3.2 Demand for first aid skills training

In emergencies, timely and effective first aid measures can significantly enhance patient safety and reduce further harm from accidents or illnesses. However, family members' first aid skills are often weak and require continuous training to improve. "Last night, my partner was choked by a mouthful of phlegm, his eyes rolled back. I immediately got up to elevate the head of the bed, patted his back, and he passed through in one breath. Fortunately, the nurse had previously taught us what to do when someone is choking." (F5)

6.2.4 The need for family care capacity enhancement and support

6.2.4.1 Demand for family care knowledge and skills training

Family members bear the responsibility of caregiving. Mastering nursing knowledge and skills can alleviate caregiving stress, allowing them to quickly assume their roles. The need for nursing knowledge and skill training is becoming increasingly urgent. "The nurse taught me how to turn my mother to prevent bedsores, but when I tried it at home, I was flustered. Once, I almost fell out of bed because I didn't hold on tight enough... I really wish someone could teach me a few more times." (F6) At first, watching the nurses perform nasogastric feeding seemed easy, but when I tried it myself, I encountered issues like not being able to get the food in. It turned out that preparing liquid food, getting it into the tube, and then flushing the tube all required attention to detail. After several more lessons, things have improved somewhat now. (F7)

6.2.4.2 Unclear channels for obtaining nursing information

The lack of clear channels for obtaining nursing information is a widespread issue in current nursing practice, especially in primary healthcare facilities and home care settings. "Online information is too chaotic; some say to be more active, others suggest resting quietly. If there were a reliable platform that could provide authoritative guidance on what to do, we wouldn't end up confused or taking detours." (P3)

6.2.4.3 Caregiver stress and need for psychological support

For family members who have long been responsible for caregiving, as they age, they not only face the challenge of gradually declining physical functions but also bear immense psychological pressure, making the need for psychological support increasingly prominent. "Caring for my spouse for three years has been exhausting; I'm all alone, and I can't even leave. There's no one to talk to, and it feels like I'm under tremendous mental stress. It would be great if someone could offer some guidance or help me talk to other family members." (P4)

6.2.5 Psychological and social support network needs

6.2.5.1 Targeted intervention needs for patients' psychological rehabilitation

When faced with complex illnesses, long-term treatments, or significant life events, the psychological state of patients has a profound impact on their recovery process and quality of life. The need for targeted interventions in patients 'psychological rehabilitation is a crucial issue in

current medical and nursing fields. "Ever since I had hemiplegia, I feel like a burden, always wanting to cry. My family only tells me' don't think too much,' but no one truly understands my pain. If I could take some sleeping pills, it wouldn't be so painful" (P5). When I can't sleep at night, I tell my son, but he just says I've slept too much during the day and gets very impatient. (P5)

6.2.5.2 Demand for social resources and policy support

In addressing complex diseases, long-term care, and mental health issues, the demand for social resources and policy support is becoming increasingly prominent. This is crucial for improving patients 'quality of life, reducing the burden on families and society, and enhancing overall rehabilitation outcomes. "We can't afford the multifunctional hospital bed, assistive devices, and medical insurance coverage. If we could apply for subsidies, the pressure would be much less." (F8)

6.2.5.3 Demand for home environment adaptation to aging

Elderly patients with weakened brains and strokes need a comfortable and safe home environment more than ever. Age-friendly renovations have become an essential means to improve the quality of life and safety at home for these elderly patients. "There's no bathroom in the room, and I've fallen twice on my way to the toilet. We want to install a toilet in the room and add handrails, but we lack the resources and guidance on how to make it safe. Now we use a bedpan, which also poses hygiene issues." (F6)

7. Discussion

7.1 Advantages of home-based rehabilitation and conflicts with existing contradictions

This study confirms the potential of home-based rehabilitation in improving patients 'quality of life and reducing medical costs, consistent with the conclusions of ZHANG H's research [5]. However, the full utilization of these benefits is constrained by a shortage of nursing resources and the lack of personalized plans. Compared to developed countries, China has a larger gap in rehabilitation nursing personnel, and family caregiving capabilities are generally weak. Moreover, the homogenization of rehabilitation programs highlights the drawbacks of the current "one-size-fits-all" approach, suggesting that precision medicine concepts should be adopted, incorporating patients' frailty levels, types of functional impairments, and family support capabilities into a dynamic evaluation framework.

7.2 Feasibility and innovation of the improvement path

The continuous care needs of elderly patients with frailty and stroke are increasing, calling for improvements in the medical system to continuously standardize and enrich the content of continuous care. This is consistent with the findings of HAN C [6]. (1) Establishing a regional nursing resource assistance network: By integrating hospital, community, and family resources, a regional resource allocation mechanism can alleviate the shortage of nursing personnel, but it requires policy support. (2) Implementing tiered training for family caregivers: Through a "theory-practice-assessment" model, this approach enhances family caregiving and emergency response capabilities, but regular retraining is needed to ensure sustainability. (3) Empowering personalized rehabilitation plans through technology: The application of intelligent assessment tools and remote monitoring can address the shortcomings of traditional methods, but issues such as technical costs and the digital divide among the elderly population must be resolved.

8. Limitations and future directions of research

This study is limited by the regional nature of qualitative data and sample size. In the future, cross-regional studies should be expanded and quantitative analysis should be introduced.

9. Conclusion

This study explores the needs for continuity of care in home-based rehabilitation after discharge among elderly frail stroke patients and their family caregivers. The results reveal multiple challenges faced by patients during home-based rehabilitation, including difficulties in accessing professional nursing resources, the need for personalized home-based rehabilitation, the need for complication prevention and emergency response, the desire to enhance family caregiving capabilities and support, and the need to strengthen the patient's psychological and social support network. These needs call for standardized continuity of care to improve the patient's health management abilities, increase patient compliance, thereby enhancing the effectiveness of home-based rehabilitation. Through continuity of care, patients can effectively control disease progression under the guidance of medical professionals, reducing negative impacts on the rehabilitation process.

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