

# From Functional Recovery to Social Reintegration: A Patient Journey Mapping Study of Rehabilitation Needs Among Young and Middle-Aged Stroke Survivors

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## Research Article

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# Abstract

## Background

Stroke rehabilitation involves more than the recovery of physical function. For young and middle-aged stroke survivors, cerebral infarction often occurs during critical periods of career development and family responsibility, resulting in challenges related to psychological adjustment, family role reconstruction, self-management, and social reintegration. Although previous studies have extensively examined functional outcomes, return-to-work factors, and psychosocial problems after stroke, limited attention has been paid to how rehabilitation needs dynamically evolve throughout different stages of recovery. Understanding these changing needs is essential for developing continuous and patient-centered rehabilitation services.

## Objective and Methods

This study aimed to explore the dynamic trajectory of rehabilitation needs among young and middle-aged stroke survivors with limb dysfunction throughout the recovery process and identify key challenges and service gaps at different rehabilitation stages.

A descriptive qualitative study was conducted using purposive sampling with maximum variation sampling. Eighteen young and middle-aged patients with cerebral infarction and limb dysfunction were recruited from a tertiary Grade A hospital in Anhui Province, China. Data were collected through semi-structured interviews and analyzed using directed content analysis with NVivo 15 software. The identified themes were organized chronologically according to rehabilitation stages, and a patient journey map was developed to visualize changes in patients' experiences, emotions, and rehabilitation needs.

## Results

Four major stages of the rehabilitation trajectory were identified: onset recognition and diagnosis, early rehabilitation, continuous rehabilitation, and social reintegration. Across these stages, patients experienced a progressive transformation of rehabilitation needs, shifting from disease understanding and treatment adaptation toward functional recovery, self-management development, and restoration of social roles. A total of 25 themes were identified and categorized into three dimensions: rehabilitation tasks, emotional experiences, and pain points. The patient journey map revealed stage-specific challenges, including insufficient disease awareness during the diagnostic phase, difficulties in adapting to altered family roles during early rehabilitation, limited continuity of professional support after discharge, and barriers to returning to work and social participation.

## Conclusion

Rehabilitation among young and middle-aged stroke survivors is not merely a process of physical recovery but a dynamic process involving illness adaptation, identity reconstruction, self-management, and social reintegration. The rehabilitation needs of patients continuously evolve throughout the recovery trajectory, highlighting the importance of developing stage-specific and continuous rehabilitation support models.

# Introduction

Stroke is one of the major cerebrovascular diseases in China and is characterized by high incidence, prevalence, disability rates, and a substantial disease burden [1–2]. Functional impairments following stroke can significantly affect patients' quality of life and social participation, with limb dysfunction being one of the most common residual impairments. In recent years, stroke incidence has shown a trend toward younger populations, with an increasing proportion of young and middle-aged patients affected [3]. Ischemic stroke, the predominant subtype of stroke, is clinically known as cerebral infarction [4].

Compared with older patients, young and middle-aged patients with cerebral infarction are typically at important stages of career development and family life. Their rehabilitation needs extend beyond limb functional recovery to include disease-related information needs, psychological adjustment, continuous rehabilitation support, and social reintegration [5–7]. Most existing studies have focused on specific aspects, including functional outcomes, factors influencing return to work, or psychosocial issues; consequently, a comprehensive understanding of the rehabilitation needs of young and middle-aged patients with cerebral infarction and limb impairment throughout the rehabilitation trajectory remains limited. Patient journey mapping can chronologically illustrate patients' experiences, emotions, pain points, and needs across different stages, thereby identifying service gaps and unmet needs during rehabilitation [8–10]. Therefore, this study used a journey mapping approach to systematically explore the stage-specific characteristics of rehabilitation needs among young and middle-aged patients with cerebral infarction and limb impairment, providing evidence for optimizing continuous rehabilitation services and facilitating patients' social reintegration.

## 1. Materials and Methods

### 1.1 Study Design and Participants

This study was conducted in the Department of Neurology at the First Affiliated Hospital of Anhui Medical University, a tertiary Grade A hospital located in Hefei, Anhui Province, China. The hospital serves as a regional medical center providing comprehensive services for patients with cerebrovascular diseases, including stroke diagnosis, acute management, and rehabilitation-related care.

Participants were recruited between February and March 2026 using purposive sampling with maximum variation sampling. The inclusion criteria were as follows: (1) patients experiencing their first stroke event and diagnosed with cerebral infarction confirmed by computed tomography (CT) or magnetic resonance imaging (MRI) [11]; (2) aged 18–59 years; (3) presenting with unilateral or bilateral limb dysfunction that affected daily activities or work; (4) having entered the rehabilitation stage after completion of acute treatment; and (5) providing informed consent and voluntarily participating in the study.

The exclusion criteria were as follows: (1) patients with significant cognitive impairment or communication difficulties that prevented effective interviews; (2) those with severe psychiatric disorders; and (3) those with other serious organic diseases that could interfere with the interview process.

The sample size was determined based on data saturation, defined as the point at which no new themes or perspectives emerged during data collection and analysis. A total of 18 participants were included in this study. Data saturation was reached after the 16th interview; however, two additional confirmatory interviews were conducted to ensure rigor. After confirming that no new themes emerged, data collection was concluded. The final sample consisted of 18 participants, coded as N1–N18.

## 1.2 Data Collection

A semi-structured interview guide was developed based on a review of relevant literature, discussions among the research team, and preliminary interviews with two young and middle-aged stroke survivors with limb dysfunction. The guide was refined based on feedback from the pilot interviews and team discussions, and the final interview guide is presented in Table 1.

Eligible participants were identified according to the inclusion criteria and recruited through the Department of Neurology at the First Affiliated Hospital of Anhui Medical University. Potential participants were informed about the study objectives, interview procedures, and confidentiality principles before participation. Written informed consent was obtained before each interview.

The interviews were conducted by a female nurse researcher with experience in stroke rehabilitation nursing and qualitative research methods. The interviewer had received training in qualitative research and had no prior therapeutic relationship with participants. Face-to-face semi-structured interviews were conducted in a quiet and private environment between February and March 2026.

During interviews, researchers followed the interview guide while using probing questions to encourage participants to elaborate on their rehabilitation experiences. Field notes were recorded to capture contextual information and non-verbal expressions. All interviews were audio-recorded with permission and transcribed verbatim within 24 hours. Each interview lasted approximately 45 minutes.

Data collection was completed after confirmation of data saturation. The study was reported according to the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist (Supplementary Table 1)[12].

Table 1  
Interview Guide

| No. | Interview questions                                                                                                                                                                                                                                                                                                                                                     |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Could you describe your entire experience from the first onset of symptoms, seeking medical care, and finally being diagnosed with cerebral infarction? Which moments impressed you the most? What were you most worried about at that time? Did anyone (e.g., doctors, nurses, or family members) provide explanations or support that helped you feel more reassured? |
| 2   | When you realized that you might be left with limb dysfunction, what was your first reaction? How did this affect your daily life and emotional state? What were you most afraid of losing, and why?                                                                                                                                                                    |
| 3   | During hospitalization, what rehabilitation training or nursing guidance did you receive? Which aspects were most helpful to you, and which were the most difficult to persist with or caused the greatest pressure? Why?                                                                                                                                               |
| 4   | What type of rehabilitation did you receive after discharge? What was the greatest difficulty you encountered during this period?                                                                                                                                                                                                                                       |
| 5   | During the rehabilitation process, from whom or through which channels did you usually obtain help and information? Which sources were the most helpful, and which sources caused confusion or uncertainty?                                                                                                                                                             |
| 6   | After your physical condition improved, did you consider returning to work or participating in social activities? How did limb dysfunction affect your work ability and career planning?                                                                                                                                                                                |
| 7   | Looking back on the entire rehabilitation process, what unmet needs did you still experience? If there were a rehabilitation support program specifically designed for young and middle-aged patients, what aspects would you hope to improve or make different?                                                                                                        |

## 1.3 Development of the Patient Journey Map

The patient journey map was developed based on participants’ narratives and the qualitative findings generated from the data analysis.

The construction process involved three steps. First, participants’ rehabilitation trajectories were reconstructed chronologically from their narratives. Major transition points, changes in functional status, and variations in rehabilitation experiences were identified to define different stages of the rehabilitation journey.

Second, the identified themes and categories were organized into three dimensions: rehabilitation tasks, emotional experiences, and pain points. These dimensions were used to illustrate patients' evolving experiences and unmet needs across different rehabilitation stages.

Third, healthcare touchpoints, rehabilitation needs, and perceived service gaps were integrated with the identified themes to generate the visual patient journey map. The preliminary map was reviewed by members of the research team, and revisions were made through discussion to ensure that the visual representation accurately reflected participants' experiences.

## 1.4 Data Analysis

Interview data were analyzed using directed content analysis following the approach described by Hsieh and Shannon [13], with assistance from NVivo 15 software (QSR International).

The analysis consisted of four steps. First, researchers repeatedly read the transcripts to obtain an overall understanding of participants' rehabilitation experiences. Second, meaningful units related to rehabilitation needs, emotional experiences, and challenges were identified and assigned initial codes. Third, codes with similar meanings were grouped into categories, and categories were further organized into themes reflecting different rehabilitation stages.

Two researchers independently coded all transcripts and compared their coding results. Discrepancies were discussed and resolved through consensus with a third researcher. Throughout the analysis process, the research team maintained regular discussions and reflexive notes to minimize individual interpretation bias.

## 1.5 Trustworthiness

The trustworthiness of this study was ensured based on the criteria of credibility, dependability, confirmability, and transferability. Credibility was enhanced through independent coding by two researchers, regular discussions within the research team, and member checking. After the preliminary patient journey map was developed, selected participants were invited to review the findings and provide feedback to confirm whether the interpretations accurately reflected their rehabilitation experiences.

Dependability and confirmability were strengthened through researcher triangulation, a transparent analytic process, and maintenance of an audit trail. Transferability was supported by providing detailed descriptions of the study context, participant characteristics, and rehabilitation experiences.

## 1.6 Ethical considerations

### Ethical approval

for this study was obtained from the Ethics Committee of the First Affiliated Hospital of Anhui Medical University (approval number: PJ2026-02-33). All participants provided written informed consent. Participants were informed that they could withdraw from the study at any time. Interview transcripts were anonymised and stored securely in password-protected files accessible only to the research team.

## 2 Results

### 2.1 Participant Characteristics

A total of 18 participants were included in this study. The individual demographic and clinical characteristics of all participants are presented in Table 2.

Table 2  
Individual demographic and clinical characteristics of participants

| ID  | Gender | Age(years) | Education                  | Marital status | Current RTW status                                     | Time since stroke | Rehabilitation setting         | ADL *status            | *Main caregiver    |
|-----|--------|------------|----------------------------|----------------|--------------------------------------------------------|-------------------|--------------------------------|------------------------|--------------------|
| N1  | Female | 51         | Primary school             | Married        | On sick leave                                          | 11months          | Home-based rehabilitation      | Partial Assistance     | Spouse             |
| N2  | Female | 41         | Primary school             | Married        | Returned to work with modified duties                  | 4months           | Home-based rehabilitation      | Basically Independent  | Spouse             |
| N3  | Male   | 22         | University                 | Unmarried      | Not applicable                                         | 2weeks            | Outpatient rehabilitation      | Basically Independent  | Parents            |
| N4  | Male   | 35         | Junior high school         | Married        | Returned to work with modified duties                  | 13months          | follow-up/maintenance phase    | Basically Independent  | Parents            |
| N5  | Male   | 40         | Junior college             | Married        | Returned to work with modified duties/responsibilities | 6months           | follow-up/maintenance phase    | Basically Independent  | No fixed caregiver |
| N6  | Male   | 31         | Senior high school         | Divorced       | Not yet returned to work                               | 9months           | Home-based rehabilitation      | Partial Assistance     | No fixed caregiver |
| N7  | Female | 39         | Junior high school         | Married        | unable to work                                         | 6weeks            | Community-based rehabilitation | Significant Dependence | Spouse             |
| N8  | Male   | 59         | Junior high school         | Married        | Not yet returned to work                               | 8months           | Home-based rehabilitation      | Partial Assistance     | Spouse             |
| N9  | Male   | 35         | Junior college             | Married        | Returned to work with modified duties                  | 5months           | follow-up/maintenance phase    | Basically Independent  | No fixed caregiver |
| N10 | Female | 38         | Senior high school         | Married        | Returned to work with modified duties                  | 3months           | Home-based rehabilitation      | Partial Assistance     | Spouse             |
| N11 | Male   | 29         | Senior high school         | Married        | Returned to work with modified duties                  | 4months           | Home-based rehabilitation      | Partial Assistance     | Spouse             |
| N12 | Female | 45         | Technical secondary school | Married        | On sick leave                                          | 2weeks            | Inpatient rehabilitation       | Significant Dependence | Parents            |
| N13 | Male   | 55         | Primary school             | Married        | Not yet returned to work                               | 3weeks            | Community-based rehabilitation | Partial Assistance     | Spouse             |
| N14 | Male   | 47         | Junior college             | Married        | Returned to full-time work                             | 6months           | follow-up/maintenance phase    | Basically Independent  | No fixed caregiver |
| N15 | Female | 59         | Primary school             | Married        | unable to work                                         | 1week             | Inpatient rehabilitation       | Significant Dependence | Children           |
| N16 | Male   | 37         | Junior college             | Married        | Returned to work with modified duties                  | 8months           | follow-up/maintenance phase    | Basically Independent  | Spouse             |
| N17 | Female | 28         | Senior high school         | Married        | Not yet returned to work                               | 6weeks            | Community-based rehabilitation | Significant Dependence | Parents            |
| N18 | Female | 43         | Junior college             | Married        | Returned to work with modified duties                  | 4months           | follow-up/maintenance phase    | Basically Independent  | Spouse             |

Note. ADL = activities of daily living; RTW = return to work.

## 2.2 Interview Results

A total of 25 themes were identified across three aspects—tasks, emotions, and pain points—among young and middle-aged patients with cerebral infarction and limb impairment across four phases: onset recognition and diagnosis, early rehabilitation, continuous rehabilitation, and social

reintegration and return to work (see Fig. 1).

## 2.3 Phase of Onset Recognition and Diagnosis

### 2.3.1 Tasks

(1) Need for education on early symptom recognition and guidance for timely medical care. Most patients reported insufficient awareness of early symptom recognition and therefore hoped to receive guidance on identifying early symptoms of cerebral infarction and seeking timely medical care. N7: "If I had known earlier that weakness in one limb and slurred speech could be signs of cerebral infarction, I would not have delayed so long; I would have gone to the hospital much sooner." N16: "At the time, I just thought I was tired. I never expected it to be cerebral infarction. If I had known earlier, I would not have delayed."

(2) Need for explanations of etiology, awareness of risk factors, and health education support. Some patients lacked a clear understanding of the causes of cerebral infarction and related risk factors, especially the relationship between factors such as hypertension, hyperlipidemia, and high mental stress and the occurrence of cerebral infarction. Therefore, they hoped to receive systematic health education support on disease etiology, risk factors, and preventive measures. N9: "What I most want to know is what exactly caused my illness; otherwise, I keep feeling puzzled." N17: "Only after becoming ill did I realize that these minor problems could also cause major issues. I think doctors or nurses still need to explain clearly to us how to prevent them in daily life."

### 2.3.2 Emotions

☒ Shock. Patients were shocked by the diagnosis of the disease. N3: "I'm only 22—how could I have had a cerebral infarction?" N6: "When I was first diagnosed, I really couldn't believe it. I felt that I was only in my forties and in the prime of life—how could I have had a cerebral infarction?"

☒ Reassurance. The shock and disbelief following diagnosis gradually turned into reassurance as healthcare professionals patiently explained the situation. N4: "The doctor explained that my current condition was not severe and told me that since I was young and in good physical condition, early rehabilitation would also be effective. This made me feel a little more at ease." N1: "The doctor explained the cause of my illness and the current condition of my cerebral blood vessels, and also reassured me, telling me that there was still a chance of recovery and improvement. I felt much more reassured."

### 2.3.3 Pain Points

☒ Misjudgment/neglect of early symptoms. Patients lacked awareness of early symptom recognition of cerebral infarction. N3: "During the final exam period, I suddenly felt that my right leg would not obey me; walking felt a bit unsteady and I could not exert strength, and sometimes it even trembled intermittently. At first, I thought it was because I was tired or had not slept well." N8: "At that time, I was working in a factory and had been standing for a long time. Suddenly my left leg became weak, as if I were stepping on cotton, and I dragged my leg a bit when walking. At first I thought it was fatigue or numbness in my leg, and that it would get better after a rest."

☒ Insufficient risk awareness. Some patients lacked sufficient understanding of the causes and risk factors of cerebral infarction, especially paying insufficient attention to the harms of risk factors such as hypertension and hyperlipidemia, and were prone to underestimating their relationship with the occurrence of cerebral infarction. N2: "I have always been in fairly good health, with only some minor problems—just slightly high blood pressure and blood lipids—but that's not a big problem, is it? Many people have them, don't they?"

## 2.4 Early Rehabilitation

### 2.4.1 Tasks

☒ Need for role transition guidance and psychological support. Some patients reported difficulty adapting to the role transition from being the main provider in the family to being a care recipient, and were prone to feelings of frustration, guilt, and helplessness. They therefore expressed a clear need for guidance on role transition and psychological support. N5: "Since becoming ill, I have gone from being the pillar of the family to being a patient who needs to be cared for. I feel terrible and very frustrated. I dare not say too much to my parents because I am afraid they will worry. If a professional could help me talk things through, it might be a bit better." N8: "After I became ill, my family took care of me with all their heart. I felt very guilty and thought I had become a burden to the family. I was very sad, but I did not know how to adjust myself."

☒ Collaborative support for family caregiving. Patients who mainly underwent home-based rehabilitation reported that family members often had inconsistent opinions regarding diet management, activity arrangements, and limb function training. They therefore hoped to receive unified guidance and coordinated support for family caregivers, so as to reduce caregiving disagreements and improve the implementation of home rehabilitation. N6: "After discharge, my father kept telling me to rest more, while my wife urged me to keep exercising as the doctor said. Everyone in the family meant well, but their advice was different, which made me even more confused. If someone could gather the family together and explain clearly how to provide care and how to exercise, it would be much better." N13: "If the doctor could gather the family together and explain clearly and set a standard so that everyone follows the same approach, I would feel more at ease."

### 2.4.2 Emotions

▣ Expectations for rehabilitation. Most patients held relatively positive attitudes toward recovery and hoped to improve limb function through persistent rehabilitation training. N4: “I feel that as long as I keep practicing, I will gradually get better.” N9 also stated, “Although my recovery has been relatively slow, I still believe that continuing to practice will be effective.”

▣ Fatigue and disappointment. Because rehabilitation training is repetitive and monotonous, and functional improvement is not obvious in the short term, patients are prone to feelings of fatigue and disappointment. N7 said, “Practicing over and over every day feels pretty much the same; it is indeed a bit tiring and quite frustrating.”

### 2.4.3 Pain Points

▣ Coping with family role transitions. During early rehabilitation, patients shifted from being the primary bearers of family responsibilities to care recipients. They found it difficult to adapt to this role change within a short period and were prone to a sense of loss and of feeling like a burden. N12: “In the past, I was the one managing many things at home; now, instead, I need others to take care of me. It really feels awful.” N1: “Since becoming ill, I can’t help with anything at home, and my family has to revolve around me. I feel like I have become a burden.”

▣ Inconsistent family caregiving approaches. During home-based rehabilitation, family members often held differing views on rest, diet, and rehabilitation training, which easily made patients feel confused and stressed. N11: “My mother thought I should rest more, while my spouse kept urging me to exercise. I was caught in the middle and did not know whose advice to follow.” N6: “Everyone in my family wanted to take care of me, but each person said something different, which made me even more confused.”

## 2.5 Continuous Rehabilitation Phase

### 2.5.1 Tasks

▣ Need for continuous rehabilitation service provision. Patients generally hoped to continue receiving professional rehabilitation support after discharge, including regular assessment of rehabilitation progress, guidance on training, adjustment of rehabilitation plans, and service coordination among community, family, and hospital, so that the rehabilitation process would be more continuous and targeted. N9: “If, after discharge, a doctor could regularly check how I am recovering and tell me how to train in the future, I would feel more confident.”

▣ Support for self-monitoring and self-management. During the continuous rehabilitation phase, patients needed to perform long-term blood pressure monitoring, take medication regularly, control their diet, arrange exercise, and prevent recurrence. However, due to the lack of systematic guidance, patients hoped to receive continuous support for health monitoring, behavioral management, and identification of recurrence warning signs. N6: “If someone clearly explained to me how to persist long term with measuring blood pressure, taking medication, and exercising, I would feel more at ease.”

### 2.5.2 Emotions

▣ Rebuilding hope. After experiencing fatigue and disappointment during early rehabilitation, patients in the continuous rehabilitation phase began to rebuild confidence in rehabilitation and future life as their limb function gradually improved and their ability to adapt to daily life increased. N3: “Seeing that I am a bit better than before, I feel there is still hope.” N1: “Although I have not fully recovered now, I am much better than when I was first discharged. I think that if I keep going, I should make further progress.”

▣ Fear of recurrence. During the long-term rehabilitation and home life in the continuous rehabilitation phase, patients were more sensitive to abnormal bodily changes and often experienced tension and anxiety due to worry about recurrence or another attack. N5: “Sometimes when I feel unwell, I get nervous, afraid that it might be recurring.” N17: “Now, as long as there is something slightly wrong with my hands or feet, I panic, afraid that it will happen again.”

### 2.5.3 Pain Points

▣ Lack of continuous professional feedback after discharge. After patients returned from the hospital to a home or community rehabilitation setting, assessments of rehabilitation outcomes, adjustments to training methods, and stage-specific recovery feedback were often difficult to obtain in a timely manner. Due to the lack of professional feedback, patients developed uncertainty about their own recovery. N11 also stated, “When I was in the hospital, someone was keeping an eye on me. After going home, I don’t know whether my training is effective, and I’m afraid I’m not doing the movements correctly.”

▣ Inadequate continuous health management. Patients lacked long-term, systematic guidance and support in areas such as blood pressure monitoring, dietary control, and recurrence prevention, making it difficult to sustain health management. N4 said, “I know I should keep measuring my blood pressure and take my medication on time, but I always forget, and I take a chance, thinking that missing one dose won’t matter.”

## 2.6 Social Reintegration and Return-to-Work Phase

### 2.6.1 Tasks

☒ Need for return-to-work assessment and guidance. When preparing to return to work, patients generally hoped to receive professional assessment and guidance regarding the timing of return to work, work intensity, whether the position was suitable, and how to balance work and rehabilitation. N1: “I want to go back to work, but I don’t know whether my current condition is actually suitable.”

☒ Emotional counseling and psychological adjustment. During social reintegration, patients often worried about decreased work ability, social evaluation, and disease recurrence, and hoped to receive continuous emotional counseling and psychological adjustment support. N13: “It’s not that I don’t want to go back; I just keep worrying that I won’t do well. If someone could help me adjust this state, that would be great.”

## 2.6.2 Emotions

☒ Hope for return. Patients generally hoped to return to their original work and life as soon as possible and to resume their social roles. N5: “I still want to return to my previous life as soon as possible; I can’t keep staying like this.” N11: “I just hope I can gradually return to the state of working and living normally as before.”

☒ Social nervousness. When re-entering work and social interaction settings, patients often felt nervous and uneasy because they worried about abnormal movement, decreased work ability, or being noticed by others. N8: “When I see acquaintances, I feel a bit tense inside, afraid that others will notice that my walking posture is unnatural.” N18: “When there are many people around, I get nervous; I’m afraid that others will ask questions, and also afraid that I won’t perform well.”

☒ Rebuilding confidence. As their function gradually recovered and their attempts to return to work progressed, some patients began to rebuild confidence in their own abilities and future life. N17: “After gradually being able to do some things again, I feel that I can still recover a little more.” N12: “Now I am much better than at the beginning, which also makes me feel that I am not completely incapable.”

## 2.6.3 Pain Points

☒ Insufficient return-to-work guidance. Patients reported that after entering the social reintegration and return-to-work phase, they lacked systematic guidance on issues such as when to return to work, how to adjust their workload, and how to adapt to their position. The return-to-work process was mostly a matter of figuring things out on their own by trial and error. N9: “Whether I can go back to work and whether I can still do my previous job—I’ve basically been trying it out bit by bit on my own.” N15 also stated, “No one specifically told me how to transition back to work; I could only figure it out as I went along.”

☒ Inadequate psychological support. Patients felt nervous, worried, and self-doubting when returning to work and reintegrating into society, and they lacked targeted psychological support and guidance on emotional adjustment. N3 said, “Sometimes I feel a lot of psychological pressure, but I don’t know who to talk to.” N16 mentioned, “Everyone thinks I’m more or less better, but actually I still feel panicked inside.”

## 3. Discussion

### 3.1 Rehabilitation needs among young and middle-aged patients with cerebral infarction extend beyond functional recovery toward life-role reconstruction

This study explored the evolving rehabilitation experiences and needs of young and middle-aged patients with cerebral infarction and limb dysfunction throughout the recovery trajectory. The findings demonstrated that patients’ needs were dynamic rather than static, evolving from disease awareness and adaptation, to functional recovery and self-management, and ultimately toward social role reintegration.

Previous studies on stroke rehabilitation have primarily focused on clinical outcomes, including motor function recovery, improvement in activities of daily living, and risk factor management, while relatively less attention has been given to how patients interpret their illness, reconstruct their identities, and reintegrate into society during long-term recovery [14–15]. This issue is particularly important for young and middle-aged patients, as cerebral infarction often occurs at a life stage characterized by career development and substantial family responsibilities. The disease affects not only physical functioning but also professional identity, family roles, and perceived social value [16]. Therefore, rehabilitation for young and middle-aged patients with cerebral infarction should not be viewed merely as a process of functional restoration, but rather as an adaptive process involving the reconstruction of daily life and social roles.

Previous international studies have shown that stroke recovery involves more than physical functional improvement. Patients may experience changes in illness perceptions, increased uncertainty regarding the future, and restrictions in social participation, all of which represent important challenges during rehabilitation [17–18]. By integrating patients’ experiences across different stages of recovery, patient journey mapping can help identify gaps in rehabilitation care from the patient perspective. In this study, this approach was used as an analytical framework to understand the rehabilitation trajectory of young and middle-aged patients with cerebral infarction. The findings revealed clear stage-specific changes in rehabilitation needs, providing evidence for the development of more targeted and coordinated rehabilitation services.

### 3.2 Early recognition and diagnosis stage: Insufficient health awareness highlights the need for earlier stroke prevention education

This study found that young and middle-aged patients often lacked sufficient awareness of early stroke symptoms and misinterpreted manifestations such as limb weakness and slurred speech as fatigue or transient discomfort, resulting in delayed medical seeking. Due to their relatively young age, some patients underestimated the importance of risk factors such as hypertension and hyperlipidemia, making disease onset appear unexpected and sudden. In recent years, stroke has increasingly affected younger populations. In addition to insufficient awareness of disease risk, factors such as high occupational stress, unhealthy lifestyles, and inadequate chronic disease management may further increase the risk of cerebrovascular disease among young and middle-aged adults. Previous studies have shown that young and middle-aged patients with cerebral infarction may experience greater shock, uncertainty, and psychological stress after diagnosis because they often lack sufficient psychological and disease-related knowledge preparation before onset[19]. The findings of this study are consistent with previous evidence.

Therefore, stroke-related health education for young and middle-aged adults should not be limited to individuals who are already identified as high-risk populations but should be initiated earlier during the prevention stage. Healthcare professionals can improve individuals' ability to recognize early stroke symptoms through health management programs, community-based education, and screening for cerebrovascular risk factors, thereby reducing delays in seeking medical care and improving early intervention.

### **3.3 Early rehabilitation stage: Balancing functional recovery and identity reconstruction among young and middle-aged stroke survivors**

This study found that during the early rehabilitation stage, although patients expected functional improvement, they also experienced rehabilitation-related fatigue, slow recovery progress, and changes in family roles. Conventional rehabilitation approaches often emphasize motor training and functional improvement; however, for young and middle-aged patients, physical impairment also carries broader social implications. Many young and middle-aged adults serve as important contributors to family income and social roles. After stroke onset, some patients may experience a transition from being "providers of family support" to "recipients of care," which may contribute to feelings of loss, self-blame, and reduced self-worth.

Previous international studies among young stroke survivors have reported similar findings [20]. Compared with older patients, young and middle-aged patients place greater emphasis on occupational recovery, family responsibilities, and social participation. Their rehabilitation goals extend beyond improving physical function to regaining previous lifestyles and social identities. This study also found that inconsistencies existed among family members regarding caregiving approaches during rehabilitation. Family members may serve as both facilitators and barriers to effective rehabilitation. Therefore, rehabilitation interventions should extend beyond individual patient education toward a patient–family collaborative rehabilitation model, including family rehabilitation guidance, shared goal setting, and enhanced communication and coordination, thereby improving the effectiveness of family support.

### **3.4 Continuous rehabilitation stage: Gaps in continuity of care hinder long-term rehabilitation self-management among stroke survivors**

This study found that after discharge, stroke survivors encountered insufficient professional guidance and feedback, difficulties in self-management, and concerns about recurrent stroke. These findings suggest that continuity of stroke rehabilitation services remains an important area for improvement. Previous international studies have reported that stroke survivors often experience challenges during the transition from hospital to home, including insufficient rehabilitation guidance, limited follow-up support, and inadequate coordination of community resources [21–22].

For stroke survivors, discharge does not represent the end of rehabilitation needs; rather, it marks the beginning of a longer and more complex phase of self-management. During this stage, patients require not only guidance on rehabilitation exercises but also continuous professional feedback to evaluate recovery progress, adjust rehabilitation plans, and maintain healthy behaviors. Therefore, future rehabilitation care models should strengthen transitional care and establish continuous support systems integrating hospitals, communities, and families. Potential strategies include nurse-led follow-up, remote rehabilitation guidance, and digital health-supported management platforms to continuously monitor rehabilitation progress and dynamically adjust support according to individual needs.

### **3.5 Social reintegration and return-to-work stage: Beyond functional recovery toward social participation among young and middle-aged stroke survivors**

This study found that the social reintegration and return-to-work stage represents an important but often overlooked phase, particularly relevant to young and middle-aged patients. Although physical function had improved to varying degrees, patients continued to experience difficulties in determining the appropriate timing for return to work, concerns about work capacity, and challenges in resuming social interactions. Existing rehabilitation evaluation systems primarily emphasize physical function outcomes, while social participation and vocational recovery remain relatively underrepresented[23–24]. For young and middle-aged patients, improvements in physical function alone may not represent comprehensive recovery if they are unable to resume work and social activities.

Therefore, rehabilitation services should further expand their goals by incorporating vocational rehabilitation and social participation into long-term care plans. A multidisciplinary team involving nurses, rehabilitation therapists, psychological professionals, and vocational rehabilitation specialists can provide return-to-work readiness assessments, workplace adaptation training, and psychological support. Such interventions may help patients move beyond the patient role and gradually rebuild their social identities.

## 4 Conclusion

This study explored changes in rehabilitation experiences and needs among young and middle-aged patients with cerebral infarction and limb dysfunction throughout the recovery trajectory using a patient journey mapping approach. The findings demonstrated that rehabilitation needs in this population were dynamic and multidimensional across different stages. The rehabilitation trajectory consisted of four stages: initial recognition and diagnosis, early rehabilitation, continuous rehabilitation, and social reintegration. At different stages, patients experienced distinct challenges, including insufficient disease awareness, difficulties in role adaptation, inadequate ongoing rehabilitation support, and barriers to social participation.

For young and middle-aged patients with cerebral infarction, rehabilitation goals extend beyond improving physical function and also encompass psychological adjustment, family role reconstruction, development of self-management skills, and restoration of social roles. These findings highlight the need to move beyond rehabilitation models that primarily focus on hospital-based treatment and functional training toward patient-centered and continuous rehabilitation support that addresses patients' evolving needs throughout the recovery trajectory.

## 5 Implications

The findings suggest that rehabilitation services should establish a staged and continuous support system incorporating disease-related health education, family collaboration, long-term rehabilitation management, and return-to-work support to support patients' transition from disease adaptation to functional recovery and eventual social participation.

## 6 Limitations

This study has several limitations. First, participants were recruited from a single center, which may limit the transferability of the findings. Second, the rehabilitation journey framework was constructed based on patients' subjective experiences. Future multicenter longitudinal studies involving multiple stakeholders are needed to further validate and refine these findings.

## Abbreviations

ADL  
Activities of Daily Living  
RTW  
Return to Work.

## Declarations

### Ethics approval and consent to participate

This study has been approved by the Ethics Committee of the First Affiliated Hospital of Anhui Medical University, with ethics approval number PJ2026-02-33. This study was conducted in strict accordance with the requirements of the Declaration of Helsinki. Prior to the start of the study, all participants provided informed consent and voluntarily participated in this study.

Clinical trial number: not applicable.

### Consent for publication

Not Applicable.

### Availability of data and materials

The qualitative interview data generated and analyzed during this study are not publicly available due to confidentiality and ethical restrictions. However, anonymized data may be available from the corresponding author upon reasonable request.

### Competing Interests

The authors declare that they have no competing interests.

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Author Contributions

JQ.C.: Writing – original draft.  
YY.L.: Investigation; Writing – review and editing.  
ZJ.S.: Formal analysis; Writing – review and editing.  
CQ.W.: Validation; Writing – review and editing.  
Y.H.: Methodology; Writing – review and editing.  
SH.H.: Funding acquisition; Writing – review and editing.

All authors read and approved the final manuscript and agree to be accountable for all aspects of the work.

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## Figures

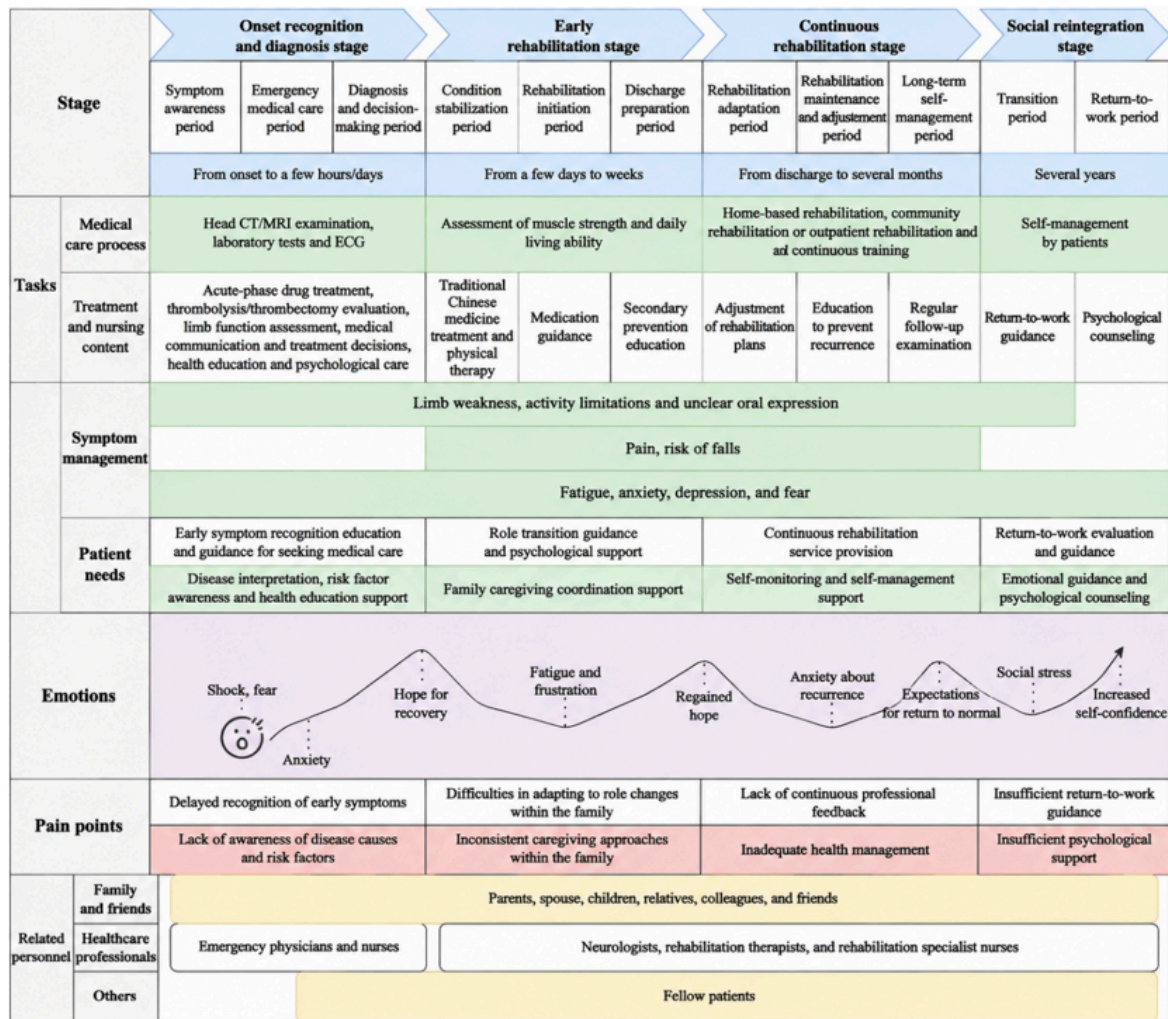


**Figure 1**

Patient journey map of stage-specific multidimensional rehabilitation needs in young and middle-aged adults with limb dysfunction after cerebral infarction.