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Transitional Rehabilitation Gaps from Hospital to Home in Primary–level Hospital Stroke Patients with Hemiplegia

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Abstract

There is a golden window period for neurological recovery after stroke (2–3 months), but rehabilitation resources are severely insufficient in primary hospitals. To explore the transition points in rehabilitation training for stroke patients with hemiplegia in primary hospitals and the challenges faced by family members as non-professional caregivers. A narrative review was conducted based on published English and Chinese literature. Informal clinical observations during the clinical internship period were included as supplementary background evidence. However, two large-scale RCTs found no improvement in 6-month functional outcomes with caregiver delivered rehabilitation, suggesting that Task-Shifting should be limited to standardized, low-risk tasks. Family rehabilitation education is a feasible approach to addressing the issue of transitional gaps, but fundamentally, increased investment in primary rehabilitation resources remain essential.

Keywords

stroke, rehabilitation, primary hospital, transitional care, family caregiver

1. Introduction

Stroke is the leading cause of disability in adults. In China, stroke incidence and mortality rates are higher in rural areas than in urban areas [1], which leads more severe challenges for rural communities. Research on neural plasticity has shown that after a stroke, the brain enters a heightened state of plasticity, during this period, new axons sprout, new synapses form, and sensory motor functions are remapped that directly drive motor recovery [2]. However, this window of plasticity is not permanently open. The CPASS study found that the optimal sensitive period for motor recovery lies between 60- and 90-days after stroke, with limited effectiveness observed within 30 days or after six months [3]. The golden window of two to three months following stroke is a critical period that determines long-term functional recovery in patients.

Stroke rehabilitation is a continuous process from “hospital – community - home”. International literature refers to the rehabilitation interruption caused by the discontinuity of care when patients suddenly shift from a professional care environment to a home environment as “cliff-like transition” [4]. The quality of the transition period directly affects whether patients can receive continuous and effective training within the window period. In primary hospitals in China, the slope of this “cliff” is particularly steep. There is a severe shortage of

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rehabilitation therapists, and community rehabilitation resources are almost non-existent [5]. Family members are forced to take on the role of "non-professional caregivers" without any preparation.

However, the existing studies have not sufficiently explored during the golden period the knowledge gap among family members in primary hospitals affects patients 'neurological recovery and increases the risk of complications. This study aims to investigate the break point of transitional rehabilitation training for stroke hemiplegic patients in primary hospitals and the predicament of family members as non-professional caregivers, and put feasible suggestions and countermeasures, to provide a reference for bridging the gap between "hospital - community - family". This article first reviews the theoretical basis of the golden recovery window and cliff-like transition, then analyzes the current rehabilitation resource shortages and family caregiver difficulties in primary hospitals and finally discusses targeted countermeasures and the applicability of the Task-Shifting model in the Chinese context.

2. Theoretical Background

2.1 The Golden Window Period for Neurological Recovery After Stroke

After a stroke, the brain enters a state of enhanced plasticity. Studies have shown that during this period of enhanced plasticity, new axons grow, new synapses form, and sensory-motor functions are re-mapped [2]. This is a very special process in the adult brain, as in normal circumstances, the plasticity and connectivity of neurons in the adult brain are strictly constrained. Recent evidence indicates that these changes are driven by the molecular systems underlying learning and memory.

The CPASS study applied the core elements of the animal exercise training paradigm to humans and discovered a similar sensitive period - 60 to 90 days after stroke, with weaker effects within 30 days, and no effect after 6 months or later [3]. This conclusion has a revolutionary significance for clinical practice: if patients fail to receive adequate and correct rehabilitation training within this window period, the potential for neural plasticity will be permanently wasted.

2.2 Cliff - Like Transition

Qualitative research has indicated that the transition from the hospital to the home is a "critical but underexplored" stage in stroke care, and discharge readiness is a key factor in reducing stress and facilitating the return to daily life [4]. Recent findings further reveal that the transition period is often characterized by "uncertainty and emotional tension", and poor communication, insufficient information exchange, and inadequate discharge planning all hinder a smooth transition [6]. A qualitative longitudinal study of Chinese stroke survivors and caregivers has depicted three stages of this trajectory: the survival period, living in uncertainty, and family crisis [7]. Each stage faces significant challenges. From the above theoretical research, we can learn that whether the neuroplasticity potential of the window period can be utilized depends on the quality of care during the transition period; and in the context of primary hospitals, the quality of care during the transition period is highly dependent on family caregivers.

These two theoretical frameworks jointly provide the analytical perspective for this review: the window period determines the criticality in terms of time, while the precipitous change exposes the structural vulnerability. Their intersection leads to the exploration of how resource shortages, insufficient family caregivers, and the absence of transitional planning jointly undermine the rehabilitation potential in the primary hospital environment.

3. Literature Review

3.1 The Structural Shortage of Rehabilitation Resources in Primary Hospitals

There is a severe shortage of rehabilitation therapists. Academician Li Shukun pointed out in his proposal at the 2025 National Two Sessions that the total number of rehabilitation therapists in the country is less than 100,000, with only 3.1 per 100,000 population, which is one quarter of the international standard; the proportion of rehabilitation physicians to the general population is approximately 0.4:100,000, far lower than

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that of developed countries (5:100,000). Facing the rehabilitation needs of over 300 million chronic disease patients and 85 million disabled people, the gap is huge [8].

The primary institutions and equipment are severely lacking. An investigation conducted by experts on 19 community health centers in the Beijing urban sub-center revealed that only 52.63% of them have set up rehabilitation departments. There are widespread problems such as incomplete equipment, insufficient personnel, and low educational qualifications [9].

3.2 The Difficulties Faced by Family Caregivers

The family members are forced to compensate and have a lack of knowledge. When the therapist is unable to provide individualized guidance, the family members are forced to undertake the tasks of supervision and execution of the training, but they are generally in a state of "knowing what to practice but not knowing how to do it correctly" [10]. Common operational mistakes include incorrect force application methods, the compensatory mode being repeatedly reinforced, and a lack of the ability to recognize and adjust for pain or fatigue. For example, family caregivers may forcibly exercise the affected limb of a hemiplegic patient, not understanding intermittent and progressive overload training, believing that the longer the time, the better. The consequence is that the incorrect movement pattern is solidified, neural plasticity is strengthened in the wrong direction, the window period is wasted, and even secondary damage may occur.

Positive evidence of family member re-education. Structured caregiver education has a positive impact on the functional improvement of patients and the satisfaction of caregivers [11]. A randomized controlled trial conducted in rural areas of Chongqing showed that the rehabilitation model implemented by nurses and carried out by family members improved the physical recovery of patients without increasing the burden on caregivers [12].

3.3 Clinical Observation

This observation was based on the author's clinical internships from May 2026 to August 2026 at a rehabilitation hospital in Haikou and a primary hospital in Yibin. The observation subjects included stroke patients and their main family caregivers, covering the staffing of therapists, the implementation of training, the degree of family participation, and the standardization of operations. This observation was a non-systematic clinical observation, aiming to provide supplementary empirical evidence for literature discovery.

The rehabilitation therapists in a certain hospital in Haikou are relatively well-staffed, and the various rehabilitation departments are clearly categorized. Family members participate in the training under the guidance of the therapists, and the operational norms are relatively high. In a certain primary hospital in Yibin, the number of therapists is limited. Most of the time, family members undertake the training tasks alone, and operational mistakes are widespread. Especially when assisting with shoulder joint movements, they often shrug their shoulders as compensation or over-tighten the joint, and for hip joint movements, unstable standing is still forcibly performed. The differences between the two places are consistent with the trend reported in the literature [13], confirming the prevalence of the lack of rehabilitation knowledge among family members in primary settings.

3.4 Systemic Disruption of Transitional Care and the Contested Evidence on Task-Shifting

During the hospitalization period, the professional guidance was insufficient, and the "learning by observing" approach taken by the family members had limited effect [7]. There was no standardized transitional plan during the discharge process, and the family members did not receive systematic training. Studies have shown that stroke patients without a structured discharge plan have a significantly higher rate of unplanned readmission within 30 days after discharge [14]. After discharge, there are almost no community rehabilitation resources, and the village doctors have a lack of knowledge about rehabilitation. This results in the limited achievements during hospitalization gradually being lost after returning home.

Task-Shifting originated in 2008 when the WHO developed a public health strategy to address the severe shortage of healthcare workers in Africa [15]. The core of this strategy was to transfer tasks from highly qualified personnel to trained low-skilled or non-professional workers.

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In the field of stroke rehabilitation, two large-scale RCTs have tested this model. The ATTEND study [16] included 1,250 patients in 14 hospitals in India, with family members leading the rehabilitation. At 6 months, the death or dependence rates in the intervention group and the control group were both 47% (OR 0.98, 95% CI 0.78 - 1.23, p = 0.87). The conclusion clearly stated that "it does not support investing in stroke rehabilitation services by transferring tasks to family members." The RECOVER study [17] included 246 patients in rural areas of China. Similarly, it failed to improve the Barthel Index at 6 months (70.1 vs 74.1, mean difference -4.0, 95% CI -10.0 to 2.9).

4. Discussion

4.1 Summary of Current Issues

Based on the literature review and clinical observations, there is a systematic break in the stroke rehabilitation process at the primary level in four aspects: insufficient human resources or equipment in the hospital, no standardized transition plan upon discharge, lack of family members' ability at the family end, and a lack of resources at the community end. As a result, the potential of neural plasticity during the golden window period is wasted. What's more serious is that incorrect care may cause secondary harm to patients by solidifying incorrect action patterns and inducing complications.

4.2 The Applicability of the Task-Shifting Model from Africa to China

The failure of these two studies has prompted us to analyze the limitations of the applicability conditions of Task-Shifting in the field of stroke rehabilitation:

First, the differences in the degree of standardization of disease management. Task-Shifting in the context of HIV/AIDS is supported by highly standardized medication procedures and strict quality control; while stroke rehabilitation is highly dependent on individualized assessment, and the degree of standardization is much lower than that of HIV medication management [18].

Second, the differences in the psychological states of the executors [19]. Family members simultaneously bear emotional stress, care burden, and economic anxiety, which directly affect the quality of training; this variable does not exist among professional therapists.

Third, the absence of a supervision system [20]. Even with initial training, the lack of continuous professional supervision and quality control mechanisms makes it difficult to guarantee the quality of training carried out by family members.

Implications for the grassroots scenarios in China: The Task-Shifting concept can be partially borrowed. Daily training with high standardization and low risk can be transferred to family members, such as proper limb positioning and maintaining passive joint range of motion. However, it must be accompanied by: ① systematic training and assessment; ② regular professional supervision and adjustment by professionals; ③ clear boundaries between "transferable" and "non-transferable" tasks. Simply "handing over" the entire rehabilitation process to family members without distinction is doomed to be ineffective or even harmful.

4.3 Improvement Measures for Addressing Existing Problems

During the hospitalization period, systematic rehabilitation education should be provided to the family members. The training objective is not to make the family members become "professional therapists", but to achieve "not to hinder the treatment and reduce secondary injuries" [11]. The training content should include correct assistance techniques, identification of compensatory patterns, and judgment of when to seek help. The Task-Shifting model can be referred to, but the scope and conditions of the transferred tasks should be limited.

Before discharge, an individualized home rehabilitation plan should be formulated, and the therapist should conduct an operation assessment for the family members. After discharge, a regular follow-up mechanism such as phone calls, video calls, or home visits should be established. Some experts have pointed out that collaborating with professionals and receiving follow-up support after discharge are the key elements for a successful transition [7].

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The fundamental solution lies in increasing the staffing and benefits of primary rehabilitation therapists, elevating rehabilitation medicine to a national-level discipline, expanding the scale of graduate student admissions, and incorporating family rehabilitation education into medical insurance or basic public health services [20]. This will substantially promote the construction of a “hospital-community-family” three-level rehabilitation network.

4.4 Research Limitations

This article is a narrative review supplemented by informal clinical observations, without systematic quantitative or primary qualitative data. Therefore, it is impossible to establish causal relationships between the variables or to quantitatively assess the effect size of the family training. The sample is limited, and the observation only involved two hospitals, which cannot fully reflect the overall picture of stroke rehabilitation in primary hospitals in China. No multi-observer cross-validation was adopted. The observation records and interpretations may be influenced by the author's own knowledge background and value assumptions. The observation only covered approximately 3 months, and it was unable to capture the long-term dynamic changes of transitional care.

4.5 Future Expectations

Further empirical research is needed to verify the actual effectiveness of structured family education in the rehabilitation of stroke patients at the primary level. Considering the large population base of China and the increasingly serious problem of aging, the implementation path of Task-Shifting in its local context in China should be explored. Carry out multi-center and cross-regional comparative studies to reveal the heterogeneity of the breakpoints under different resource allocation levels.

5. Conclusion

The 2–3-month period after a stroke is the critical window period that determines the long-term functional recovery of patients. However, in primary hospitals, there is a triple predicament of severe shortage of rehabilitation therapists, almost non-existent community rehabilitation resources, and widespread lack of rehabilitation knowledge among family members. This has led to the systematic waste of this precious neural plasticity window period. Structured training for family members is a feasible transitional solution in the short term. It is not to make family members become therapists, but to help them “not to cause trouble and reduce secondary injuries”. However, the fundamental solution still lies in increasing the investment in rehabilitation human resources at the primary level and promoting the construction of a “hospital-community-family” three-level rehabilitation network. The Task-Shifting concept can be borrowed to a limited extent, but it is necessary to fully assess its applicability in the Chinese grassroots scenario and implement strict training, assessment and quality control mechanisms. In the future, more empirical studies are needed to verify the actual effect of family education in grassroots stroke rehabilitation and explore localized implementation paths suitable for China's national conditions.

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Conflicts of Interest

The authors declare no conflict of interest.

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