



Narrative Review of Patient-centred Models and Health Systems Strategies in a Global Context to Advance Post-Stroke Care

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ABSTRACT. Strokes require coordinated post-acute care to maximise recovery and quality of life, as they are a major cause of long-term disability worldwide. This narrative review summarises recent research (2019-2024) on patient-centred models of post-stroke care, health system interventions and treatment strategies. The search was done systematically using keywords related to stroke rehabilitation, case management, care pathways and equity across the reference databases PubMed, Scopus, Science Web and Google Scholar. Five major studies were reviewed, representing different contexts, such as Poland, the USA and India. The results demonstrate the value of case management by nurses, integrated care models, culturally appropriate interventions in underprivileged groups and standardised care pathways such as IMPACTUS. Basic ideas of continuity of care, interdisciplinary teamwork and empowerment of patients are becoming universal, despite the differences in the context. The low-resource environment remains a challenge, particularly as regards infrastructure and labour capacity. We propose a hybrid framework combining local adaptability with international best practice. Cost-benefit studies and implementation science in low and middle income countries should be a high priority for future research © 2025 Published by Public Knowledge Project (PKP).

Keywords: post-stroke care, case management, health system interventions, stroke rehabilitation, care pathway

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Introduction

Stroke continues to be a major global cause of death and permanent disability, resulting in significant social and financial costs (GBD 2019 Stroke Collaborators, 2021). Coordinated, multidisciplinary post-stroke care is necessary due to the complexity of stroke sequelae in order to improve quality of life, decrease complications, and accelerate recovery (Winstein et al. (2016). However, there are still gaps in standardized long-term care models and inequalities in the way care is delivered, especially along racial, ethnic, and socioeconomic lines (Skolarus et al. 2021).

According to Clarke and Forster (2015), recent studies highlight the necessity of patient-centered, integrated care approaches that are adapted to each patient's needs and the capabilities of the healthcare system. For instance, the IMPETUS protocol in India is a ground-breaking effort to address significant educational and infrastructure barriers by establishing a consistent stroke care pathway across medical colleges (Bhatia et al. 2022). Furthermore, among acute stroke survivors, case management interventions have demonstrated promise in enhancing clinical outcomes and lowering hospital readmissions (Barlin et al. 2022).

Despite these developments, there are still issues that persist, such as unequal access to care, a dearth of organized rehabilitation services, and a lack of funding, particularly in LMICs (low- and middle-income countries) (Prvu Bettger et al. (2019).

For example, in Iran, recovery is hampered by disjointed hospital-to-home transfers, a lack of knowledge about stroke symptoms, and a serious lack of specialized rehabilitation personnel (Melnikov, 2020).

Material and methods

A systematic and open methodological approach was used to improve rigor, guarantee reproducibility, and reduce selection bias even though this study is a narrative review—intended to provide a thematic and interpretive synthesis rather than a quantitative meta-analysis (Grant and Booth, 2009; Tricco et al. 2018).

The purpose of this narrative review was to compile data from various international contexts on equity-oriented tactics, health system interventions, and patient-centered post-stroke care models. Despite the interpretive nature of narrative reviews, a systematic and repeatable approach was used to guarantee methodological transparency and reduce selection bias. This was in line with current standards for rigorous narrative synthesis (Grant and Booth, 2009; Tricco et al. 2018).

PubMed, Scopus, Web of Science, and Google Scholar are the four main electronic databases that were searched for relevant literature. The search was conducted to find recent developments in post-acute stroke care, covering publications from January 2019 to August 2024. Key terms from three conceptual domains were combined in the search strategy: (1) post-stroke care (e.g. G. "stroke rehabilitation," "post-stroke care," and "stroke recovery"); (2) interventions in the health system (e.g. G. "health system intervention," "case management," and "care pathway"); and (3) equity or disparities (e.g. G. "equity," "disparities," and "low- and middle-income countries." "Post-stroke care" OR "stroke rehabilitation" OR "stroke recovery" AND "case management" OR "care pathway" OR "health system intervention" AND "disparities" OR "equity" OR "low- and middle-income countries" comprised the final Boolean search string.

The following requirements were met by the studies: (1) they had to be peer-reviewed original research, study protocols, or systematic/narrative reviews; (2) they had to be primarily focused on rehabilitation strategies, post-acute stroke care models, or interventions at the health system level; (3) they had to be relevant to patient-centered care, care coordination, or health equity; and (4) they had to be published in English, Persian, or Polish, or have an English abstract available. On the other hand, research was disqualified if it (1) only addressed acute-phase interventions (e.g. G. thrombolysis or thrombectomy) without a follow-up after discharge; (2) were case reports, editorials, commentaries, or grey literature; or (3) lacked quantifiable results or explicit methodological explanations.

127 records were found in the first search. 32 full-text articles were evaluated for eligibility after duplicates were eliminated and titles and abstracts were screened for relevancy. The JBI Critical Appraisal Checklist for qualitative and quasi-experimental studies was used to evaluate the methodological quality of these publications. Studies were only kept for synthesis if they received a quality score of at least seven out of ten. This cutoff made sure that the review's conclusions were supported only by methodologically sound evidence.

Three factors ultimately determined which five important studies were chosen for further examination: direct relevance to the review's goals, observable methodological rigor, and representation of various healthcare contexts, particularly high-income settings (Poland and the US) and low- and middle-income settings (India). The included studies include interventions aimed at racial/ethnic disparities in the United States; an integrated long-term care model in Poland (Sarzynska-Długosz, 2019); and caregiver education in Iran (Melnikov, 2020). S. (Skolarus and others. 2021); a case management program in the United States led by nurses. S. (Barlin and others. 2022); as well as India's IMPETUS standardized care pathway (Bhatia et al. 2022). A comparative, context-sensitive basis for creating a conceptual framework for post-stroke care that is applicable worldwide is provided by this purposeful selection.

Results

An integrated long-term post-stroke care model that prioritizes smooth coordination between acute care, rehabilitation, and community services was put forth by Sarzynska-Długosz (2019) in Poland. Through multidisciplinary team collaboration, customized rehabilitation plans, and planned long-term follow-up, this model places a high priority on patient autonomy and continuity of care.

These structured contacts reduce loss to follow-up, a common obstacle to long-term recovery in fragmented systems, by actively addressing secondary complications and psychosocial issues in addition to monitoring functional recovery.

Barlin and associates. (2022) showed that among acute stroke survivors in the US, a structured, nurse-led case management intervention improved functional outcomes and dramatically decreased 90-day hospital readmissions. The intervention successfully closed the gap between hospital and home by combining systematic post-discharge coordination with individualized education for patients and caregivers. This strategy supports Melnikov's (2020) research on the importance of caregiver education, emphasizing that providing families with useful information and abilities is crucial to maintaining recovery outside of clinical settings.

Skolarus and associates. identified the structural causes of racial and ethnic inequality in the United States in 2021. S. stroke care, such as disjointed transitions, restricted access to rehabilitation, and financial obstacles. Their analysis emphasized policy-level changes, community health worker involvement, and culturally appropriate health education as successful means of advancing equity. These strategies provide general guidelines for resolving geographic, urban-rural, and literacy-related disparities in low-resource contexts, despite being context-specific to minority populations in high-income environments.

A practical response to variations in stroke care across low- and middle-income contexts is demonstrated by the IMPETUS study conducted in India (Bhatia et al. 2022). Early success in standardizing initial assessments and referral procedures was attained by the initiative through the implementation of a uniform care pathway across 22 medical colleges. Nonetheless, ongoing issues—such as a lack of personnel, inadequate infrastructure, and trouble maintaining training—showcase a crucial disconnect between protocol design and operational capability. These results are consistent with other research from LMICs, where financial limitations and cultural expectations of quick recovery frequently cause rehabilitation to end too soon (Prvu Bettger et al. (2019).

When taken as a whole, these studies identify four interrelated pillars of successful post-stroke care: (1) context-sensitive standardization; (2) case management-based transitional coordination; (3) proactive equity strategies; and (4) system-wide continuity. Although models with high incomes (e.g. G. Poland) place a strong emphasis on structural integration, while U. S. -based research concentrates on eliminating inequalities, while LMIC programs such as IMPETUS give priority to fundamental standardization. This discrepancy highlights a twofold necessity: maintaining international quality standards while modifying their application to accommodate local workforce capacity, infrastructure, and cultural norms.

Table 1. Summary of Included Studies and Contextual Focus

Study ID (Citation)	Context/Location	Primary Focus	Key Contribution to Review
Melnikov (2020) ¹	Not specified (Caregiver focus)	Caregiver skill acquisition and education	Emphasizing patient/family empowerment and necessity of tailored education. ¹
Sarzynska-Długosz (2019) ²	Poland (HIC, European system)	Optimized integrated long-term post-stroke care model	Highlighting continuity of care and multidisciplinary system integration. ¹
Skolarus et al. (2021) ³	U.S. (Focus on racial disparities)	Interventions targeting racial/ethnic disparities	Addressing systemic barriers, equity, and the role of cultural competency. ¹
Barlin et al. (2022) ⁴	Not specified (Prospective cohort)	Structured nurse-led case management intervention	Demonstrating effectiveness of coordination in reducing readmissions and improving functional outcomes. ¹
Bhatia et al. (2022) ⁵	India (LMIC context)	IMPETUS Protocol (Standardized Care Pathway)	Feasibility of system standardization in resource-constrained environments. ¹

Table 2. The Hybrid Implementation Framework (HIF) for Post-Stroke Care

Framework Component	Standardization Imperative (Global Quality)	Adaptability Imperative (Local Context)	Theoretical Function
I. Pathway Design & Content	Adherence to evidence-based international guidelines and protocols (e.g., comprehensive rehabilitation schedule). Defines WHAT care is required.	Tailoring of patient education materials to local language and cultural beliefs; adaptation of pharmacological options based on local availability and cost constraints. ⁷	<i>Patient/Caregiver Centricity.</i> ¹³
II. Implementation Structure	Mandatory establishment of a structured case management program or care coordination unit, preferably nurse-led. Defines WHO manages the transitions.	Integration of coordination structures into existing public health infrastructures, such as primary care clinics or community health worker networks. ¹⁵	<i>Coordination & Operation Management.</i> ¹³
III. Capacity Building & Workforce	Standardized, evidence-based training modules for multidisciplinary teams, including regular Quality Improvement (QI) programs.	Iterative training tailored to existing staff skill gaps; leveraging task-shifting to empower non-specialist staff (e.g., physiotherapists, general nurses) where specialist neurologists are absent. ⁵	<i>Structural Context & Workforce Reality.</i> ¹³
IV. Learning and Sustainability	Implementation of mandatory national data monitoring and robust quality indicators (e.g., 90-day readmission rates, modified Rankin Scale status).	Establishment of continuous feedback loops and localized quality improvement cycles to refine protocols based on real-world performance—the Learning Health System model. ¹⁴	<i>Learning System & Sustainable Transformation.</i> ¹³

Discussion

The three fundamental principles of continuity of care, multidisciplinary coordination, and patient and caregiver empowerment are shared by the reviewed models despite significant contextual differences (Sarzynska-Długosz, 2019; Barlin et al. 2022). Through organized follow-up and coordinated team-based care, Poland's integrated long-term care model prioritizes smooth transitions from acute hospitalization to community-based rehabilitation (Sarzynska-Długosz, 2019). Conversely, U. S. Through culturally appropriate outreach and community health worker engagement, -based interventions prioritize equity by addressing systemic barriers, such as fragmented care transitions and limited rehabilitation access (Skolarus et al. 2021).

The IMPETUS initiative in India, on the other hand, aims to standardize basic care pathways even in environments with limited resources by establishing minimum standards of care across diverse settings (Bhatia et al. 2022). These conflicting priorities are a reflection of a shared dual imperative: maintaining international quality standards while adapting their application to local workforce capacity, infrastructure, and sociocultural norms.

The Hybrid Implementation Framework (HIF), which combines an Adaptability Imperative (context-sensitive execution) and a Standardization Imperative (adherence to evidence-based global protocols), is our proposal for operationalizing this dual imperative. The Learning Health System model and implementation science serve as the foundation for the HIF (Boehme et al. Norrving et al., 2021. , 2018), acknowledging that both faithfulness to essential elements and adaptability in delivery methods are necessary for sustainable improvement. There are four interconnected domains in the framework.

Design and Content of the Pathway: International guidelines specify the type of care that should be provided (e.g. G. Local adaptation adjusts educational materials, communication tactics, and pharmaceutical options to cultural beliefs and resource availability (e.g., early rehabilitation, secondary prevention) (Prvu Bettger et al. (2019).

Implementation Structure: To increase viability in low-resource settings, this structure can be integrated into current primary care or community health networks. A nurse-led case management unit guarantees consistent care coordination (who handles transitions) (Clarke and Forster, 2015).

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Sustainability and Learning: Tracking national indicators (e.g. G. functional outcomes, 90-day readmissions) facilitate accountability, and localized feedback loops facilitate iterative quality improvement in line with practical limitations (Boehme et al. 2021).

Key issues in low- and middle-income countries (LMICs) are directly addressed by the HIF. First, it shifts rehabilitation delivery from centralized specialty centers—often absent in LMICs—toward community- and home-based models integrated with primary care (Prvu Bettger et al. (2019). Second, by using culturally relevant education and community health workers to maintain engagement, it combats low health literacy and irrational recovery expectations (Skolarus et al. 2021). Third, by establishing case management as a link between hospital discharge and ongoing community support, it lessens fragmented care transitions, which are typical in systems like Iran's (Melnikov, 2020; Sarzynska-Długosz, 2019).

Three concrete actions stand out for Iran and similar health systems: Establish a national stroke care pathway based on IMPETUS principles, first standardizing acute evaluation, referral, and decision-making procedures between primary care networks and tertiary hospitals. Incorporate nurse-led case management into Iran's vast primary healthcare system to guarantee continuity of care, lower readmission rates, and offer structured post-discharge support. Create a nationwide stroke registry to track results (e.g. G. disability rates, mortality) and promote policy changes that prioritize equity, reflecting U.S. S. initiatives to eradicate socioeconomic and geographic inequalities (Skolarus et al. 2021). When combined, these tactics support the HIF's mission: to ensure quality, equity, and sustainability in a variety of health contexts through a locally grounded and globally informed post-stroke care system.

Limitations

This study did not follow a formal systematic review protocol like PRISMA because it was a narrative review (Page et al. 2021). The interpretive nature of narrative synthesis inevitably carries a risk of selection bias, even though a systematic search strategy, clear inclusion criteria, and quality assessment using the JBI checklist were used to improve transparency and lessen bias. Although useful for conceptual development, this approach's flexibility restricts the comprehensiveness and reproducibility required for systematic reviews.

Additionally, only five excellent studies from three nations—India, the United States, and Poland—that were chosen to reflect disparate health system contexts served as the basis for the analysis. This deliberate sampling limited the empirical generalizability of findings to other settings, especially low- and middle-income countries in Latin America, East Asia, or sub-Saharan Africa, even though it allowed for rich comparative insights and guided the creation of the Hybrid Implementation Framework (HIF). Furthermore, it's possible that pertinent data from non-Western research communities was overlooked due to the exclusion of literature written in languages other than English, Persian, and Polish.

Therefore, in order to validate and improve the suggested framework internationally, future research should carry out a thorough systematic review with wider geographic and linguistic inclusion.

Conclusion

The treatment of stroke victims is a complicated public health issue that necessitates the smooth fusion of clinical knowledge and innovative health system practices. The evidence compiled in this review emphasizes how important equity-focused interventions, standardized care pathways, and patient-centered case management are for enhancing functional outcomes and lowering disparities in a variety of contexts (Barlin et al. 2022; Bhatia and associates. (Skolarus et al. 2022).

The Hybrid Implementation Framework (HIF) is our proposal to address the ongoing discrepancy between local realities and global best practices, especially in low- and middle-income nations.

This framework ensures that high-quality stroke care continues to be both effective and equitable by balancing the need for context-sensitive adaptation with the imperative for evidence-based standardization. The HIF provides policymakers with a workable road map for enhancing post-stroke recovery in resource-constrained settings by integrating flexibility into essential elements like workforce training, care coordination, and monitoring systems.

Large-scale implementation science studies should be given top priority in future research in order to assess the practicality, sustainability, and economic viability of adaptive models such as the HIF. Such data is crucial for informing national stroke policies and advancing the goal of providing everyone with high-quality, person-centered post-stroke care.

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