International Journal of Pharmaceutical and Bio-Medical Science

ISSN(print): 2767-827X, ISSN(online): 2767-830X

Volume 05 Issue 09 September 2025

Page No : 498-506

DOI: https://doi.org/10.47191/ijpbms/v5-i9-04, Impact Factor: 8.163

Evidence-Based Initial Nursing Care for Acute Stroke in Emergency Settings: a Scoping Review

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ABSTRACT

Objective: To identify and map evidence-based practices and international guidelines related to initial nursing interventions in the emergency management of acute stroke.

Method: This scoping review followed the Joanna Briggs Institute (JBI) framework and the PRISMA-ScR checklist. A comprehensive literature search was conducted in PubMed, CINAHL, Scopus, the WHO guideline repository, and Google Scholar. Studies and guidelines published between 2015 and 2024 were included. Data extraction focused on study characteristics, nursing roles, and intervention components. Results were analyzed descriptively and thematically.

Results: Fourteen studies and guidelines met the inclusion criteria. Most originated from high-income countries, with the USA and China being the most represented. The included documents comprised experimental studies, guidelines, reviews, and implementation evaluations. Key nursing roles included stroke triage, NIHSS assessment, vital sign monitoring, dysphagia screening, thrombolysis preparation, and coordination with stroke teams. Structured protocols, such as FeSS bundles, and simulation-based training were reported to enhance care delivery and patient outcomes. However, gaps remain in the explicit articulation of nursing responsibilities in many guidelines.

Conclusion: Nurses play a critical role in the early management of acute stroke in emergency settings. Standardized, context-adapted nursing protocols and targeted training are needed to optimize stroke outcomes and ensure effective integration of nursing practices into emergency stroke pathways.

ARTICLE DETAILS

Published On:
15 September 2025

KEYWORDS: Descriptors: Stroke, Nursing care, Emergency nursing, Clinical guidelines, Triage, Evidence-based practice.

Available on:
https://ijpbms.com/

1. INTRODUCTION

Stroke is a leading cause of mortality and long-term disability worldwide, with an increasing burden in both high-income and low- to middle-income countries(1,2). The World Health Organization (WHO) and the Global Burden of Disease Study have highlighted that early intervention within the first few hours after symptom onset—often referred to as the "golden hour"—is crucial for improving clinical outcomes and reducing neurological damage(3–5).

In emergency departments (EDs), nurses are often the first healthcare professionals to interact with stroke patients(6–8). Their responsibilities range from triage and initial assessment to coordination of diagnostic procedures and preparation for reperfusion therapies. International guidelines, including those from the American Heart Association and the European Stroke Organization, emphasize the importance of rapid response systems and stroke code activation(9,10). However, these recommendations often lack specificity regarding the role of nurses, especially in the initial phase of stroke care. The integration of evidence-based nursing interventions during the early phase of acute stroke has been associated with better outcomes, including reduced door-to-needle times, improved management of vital signs, and enhanced interdisciplinary coordination(11,12). Despite these benefits, the literature remains fragmented, and there is no consolidated synthesis of international best practices focused specifically on nursing actions during early stroke management in ED.

Although international guidelines increasingly recognize the urgency of early stroke management, the specific contributions and responsibilities of nurses within emergency stroke pathways remain underrepresented. In many healthcare systems—particularly in low- and middle-income countries—nurses serve as the first point of contact and play a pivotal role in early assessment, triage, and coordination of stroke care. However, the absence of clearly defined, evidence-based nursing protocols may result in delayed interventions, inconsistent practices, and missed opportunities for timely treatment. Existing studies have demonstrated that structured nursing interventions, including the use of standardized protocols and decision-making tools, can reduce treatment delays and improve outcomes for patients with acute stroke(13). Despite these advances, there has been no comprehensive review focused specifically on nursing practices during the initial phase of stroke care in the emergency setting.

By mapping current practices, protocols, and recommendations across diverse settings, this scoping review addresses an important knowledge gap. The findings may inform the development of context-sensitive nursing guidelines and training programs, supporting improved implementation of stroke pathways and ultimately enhancing patient outcomes in emergency departments. This study aims to identify and map the evidence-based practices and international guidelines related to initial nursing interventions in the emergency management of acute stroke.

2. METHODS PROTOCOL

This scoping review was conducted following the methodological framework proposed by the Joanna Briggs Institute (JBI) for scoping reviews. The review process adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR).

Eligibility Criteria

Studies and guidelines were included if they met the following criteria: (1) Addressed initial nursing interventions in the emergency care of patients with acute stroke; (2) were published between January 2010 and March 2024; (3) were written in English; and (4) comprised original research articles (quantitative, qualitative, or mixed-methods), reviews, clinical guidelines, or expert consensus. Exclusion criteria included editorials, commentaries, conference abstracts, and studies that did not explicitly address nursing roles or interventions.

Information Sources

The following databases and platforms were searched: PubMed, Scopus, CINAHL, WHO guideline repository, and Google Scholar. Additional studies were identified through manual searches of references cited in relevant articles and guidelines.

Search in the Literature

A comprehensive search strategy was developed using keywords and Medical Subject Headings (MeSH), including: “stroke,” “nursing care,” “emergency nursing,” “acute stroke,” “triage,” “early intervention,” and “evidence-based practice.” Boolean operators AND/OR were applied to refine search combinations for each database, shown as table 1. The search was conducted in March 2024.

Selection of the Studies

All retrieved records were imported into a reference management tool, and duplicates were removed. Titles and abstracts were screened independently by two reviewers. Full texts of potentially eligible articles were then assessed against the inclusion criteria. Disagreements were resolved by consensus or with a third reviewer.

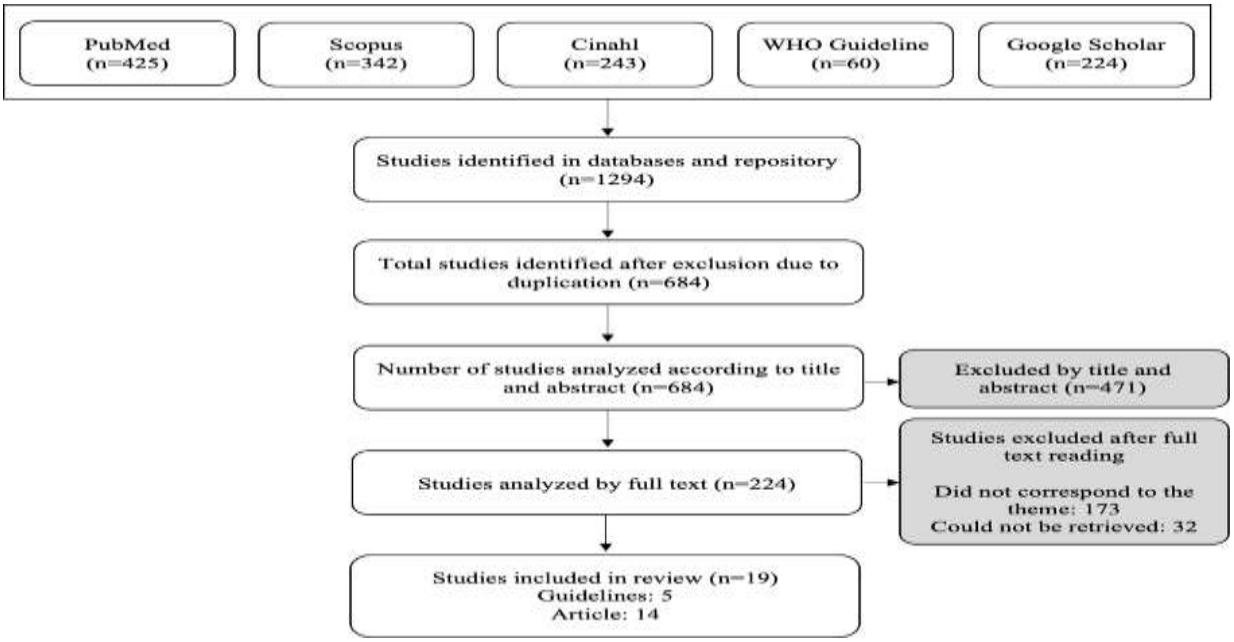

Figure 1. Flow chart of study selection

Data Extraction and Analysis

A standardized data extraction form was used to collect relevant information from the included studies. Extracted data included: author, year of publication, country, study design, focus of intervention, and nursing roles highlighted. Thematic analysis was used to identify key patterns and domains of intervention across the studies.

Summary of the Outcomes

The results were summarized using descriptive statistics and thematic categorization. Distribution of studies by country, year, and type was tabulated and visualized. Findings were grouped according to major nursing interventions reported, such as triage, assessment, protocol implementation, and coordination of care.

Table 1. Search Database Strategy

Database	Search Strategy
PubMed	("stroke"[MeSH Terms] OR "acute stroke") AND ("nursing care" OR "emergency nursing" OR "triage") AND ("intervention" OR "early treatment")
Scopus	"stroke" AND "nursing care" AND "emergency" AND "acute" AND "intervention"
CINAHL	MH "Stroke+" AND MH "Nursing Care+" AND (TX "emergency department" OR TX "early management")
WHO Guideline Repository	"stroke" AND "nursing" AND "guidelines" AND ("acute" OR "emergency")
Google Scholar	"nursing intervention in acute stroke emergency care" OR "emergency nursing role in stroke"

3. RESULTS

Table 2. Summary of Included Guidelines and Key Findings

Guideline	Organization	Year	Key Components Relevant to Nursing
AHA/ASA Guidelines for Early Stroke Management	AHA	2019–2021	NIHSS scoring, IV access, BP/glucose/temp control, thrombolysis preparation
WHO Package of Essential NCD Interventions	WHO	2020	Community screening, early detection, referral protocols
European Stroke Organization Guidelines	ESO	2021	Imaging coordination, dysphagia screening, thrombolysis eligibility
NICE Stroke Pathway	UK NHS	2022	Rapid triage, nurse-led decision support, early mobilization
Australian Stroke Foundation Acute Stroke Guidelines	Australia	2020	Pre-imaging checklist, early nursing documentation, handover protocols

Table 3. Summary of Included Studies

No.	Author (Year)	Country	Study Type	Key Focus	Nursing Role Highlighted
1	Kumar et al. (2025)	Multiple (systematic)	Systematic review & meta-analysis	Nurse involvement impact on DTN time, IVT rates, mortality	Stroke nurse decreased door-to-needle time, increased IVT, improved outcomes
2	Theofanidis & Gibbon (2016)	International	Literature review	Specific nursing acute stroke interventions	Pressure management, dysphagia, continence, early mobilization
3	Rodgers et al. (2023)	USA	Scientific statement	Post-interventional ICU stroke care	Early swallowing screen, enteral nutrition, vital sign monitoring
4	Wang L et al. (2021)	China	Prospective cohort	Nursing pathway impact on outcomes	Shorter diagnosis time, NIHSS improvement, motor recovery
5	Considine & McGillivray (2010)	Australia	Pre-test / post-test intervention	ED guideline impact on care processes	Better triage, vitals monitoring, swallow assessment, risk documentation

6	Zhao et al. (2024)	Australia	Cluster randomized trial	QASC protocol for fever, sugar, swallowing	Nurses implement FeSS protocol targeting hyperglycemia & dysphagia
7	Sun Z et al. (2022)	China	Controlled study	CT-guided IV thrombolysis nursing intervention	Pre-, during-, post-thrombolysis monitoring improved outcomes
8	Quinn (2023)	Global literature	Narrative review	Emergency nursing roles in stroke ED	tPA prep/admin, imaging coordination, patient communication
9	Ashcraf et al. (2021)	USA	Guidelines/ Statement	Prehospital and ED stroke care recommendations	Rapid triage, vital signs, NIHSS, IV access, glucose control
10	Camicia et al. (2021)	USA	Scientific Statement	Nursing care for neuro-assessment, transfer, discharge	Transitioncal care coordination, nures-led protocols.
11	Sanjuan et al. (2020)	Spain	Literature guideline review	Stroke unit nursing interventions	Admission care, imaging, reperfusion, discharge nursing
12	Middleton et al. (2019)	Australian	Cluster RCT	Triage-treatment-transfer in stroke ED	Nurse-led protocol implementation for fever, hyperglycaemia, swallowing
13	Zhang et al. (2021)	China	Prospective cohort	Emergency nursing pathway for thrombectomy	Shorter door-to-recanalization, improved NIHSS/mRS outcomes
14	Zhao et al. (2024)	International	Scoping review	Effect of simulation/education on stroke nurse practice	Training improves adherence to stroke quality measures

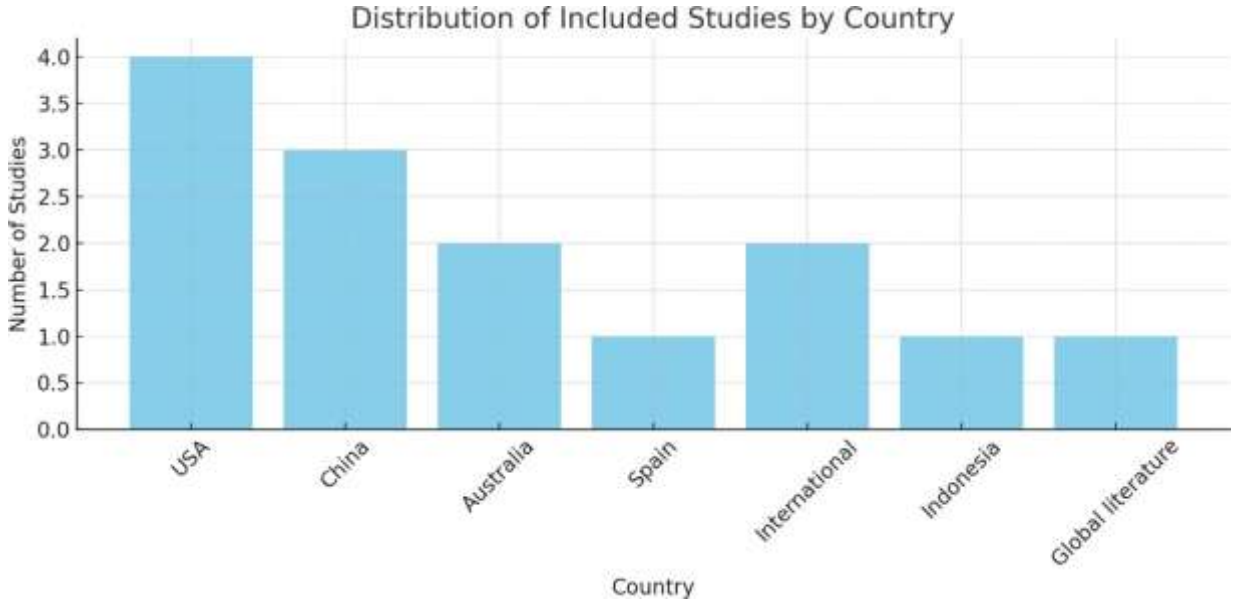

Figure 2. Distribution of included studies by country

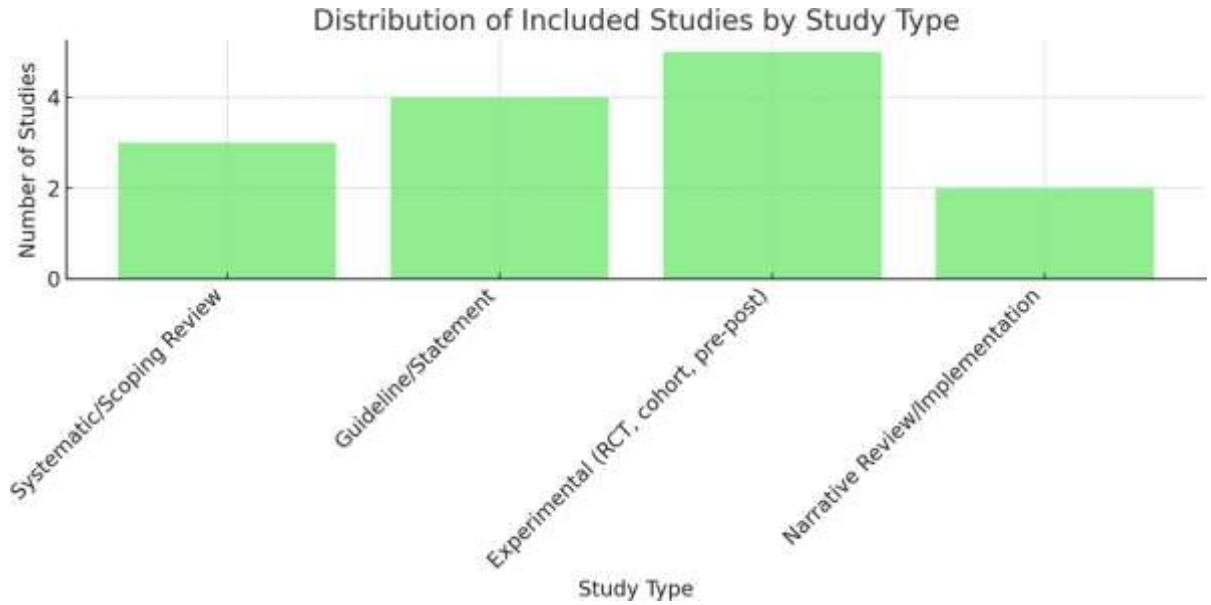

Figure 3. distribution of included studies by study tipe

4. DISCUSSION

This scoping review provides a comprehensive synthesis of 14 studies and international guidelines focusing on initial nursing interventions in the emergency care of patients with acute stroke. The findings reinforce the critical and multifaceted role of nurses in ensuring rapid, safe, and effective stroke management, particularly in the hyperacute phase.

Triage and Door-to-Needle Efficiency

Several studies emphasized the impact of nurse-led triage systems and their contribution to reducing door-to-needle (DTN) times and increasing access to intravenous thrombolysis (IVT). Results conducted a meta-analysis showing that dedicated stroke nurses significantly improved DTN metrics and patient outcomes(14). Similarly, nother research demonstrated that the implementation of structured nursing pathways in the emergency department led to shorter diagnosis-to-intervention times and improvements in NIHSS scores(15,16). These findings are supported by international guidelines, which advocate for rapid nurse-led neurological assessments, early vital signs monitoring, glucose control, and efficient IV access as foundational elements of emergency stroke care(17,18).

These results are further corroborated by studies outside the scope of this review. For example, a large retrospective cohort study in Canada found that implementing stroke code activation led by emergency nurses reduced DTN time by 24% and increased thrombolysis rates by over 15%, especially during off-hours(19). Another study also emphasized the importance of well-trained nurses in prehospital settings for rapid stroke recognition, demonstrating that pre-notification by nurses in ambulance teams was associated with faster CT imaging and treatment initiation(20). Moreover, research in a resource-limited Egyptian ED showed that when nurses received protocol-based stroke triage training, the average time from triage to CT decreased significantly (from 45 to 22 minutes), and thrombolysis eligibility assessment became more accurate. These findings highlight that the nursing role in triage is not only crucial in high-resource settings but also essential in improving stroke care in low- and middle-income countries(21).

From a systems-level perspective, early nurse-led stroke triage aligns with the “Stroke Chain of Survival” model, which places emphasis on early recognition, rapid activation, and coordinated response. Nurses are positioned to operationalize these early phases, especially when empowered through training, authority, and inclusion in rapid response protocols. Taken together, the evidence suggests that structured and nurse-led triage protocols are integral to improving time-sensitive stroke care. Their effectiveness is not merely tied to the presence of guidelines, but also to how these are operationalized in practice—underscoring the need for institutional support, interprofessional collaboration, and regular simulation-based training to maintain responsiveness and readiness in ED environments.

Structured Protocol Implementation

The FeSS protocol (Fever, Sugar, Swallowing) emerged as a widely implemented nursing bundle, particularly in the Australian context(15). These nurse-led interventions were associated with significant improvements in patient safety and complication reduction. Research from Zhang et al. further supported the effectiveness of emergency nursing protocols, particularly for patients undergoing thrombectomy, with better NIHSS and mRS outcomes(22). Standard ED stroke guidelines improved the consistency of nursing assessments and clinical documentation, suggesting that structured tools empower nurses to make timely and appropriate decisions under pressure(23).

Beyond FeSS, emerging evidence supports a nurse-led structured nursing pathway for interventional thrombectomy. A prospective cohort study found that patients receiving care via a thrombectomy-specific nursing pathway had significantly shorter times to recanalization, higher procedure success rates (92 % vs 80 %), lower NIHSS scores post-treatment, better 90-day mRS outcomes, and greater patient satisfaction(24). These data align with a systematic review that highlights the broader value of nurse-led bundle care interventions—covering physical, cognitive, and psychosocial patient needs—in improving post-stroke outcomes and care quality(25). Nurse coordination of bundle care delivered tangible benefits across domains of morbidity, mortality, and functional recovery.

Monitoring and Clinical Management

Beyond triage, nurses were actively involved in clinical monitoring throughout the stroke care continuum. Nurse-led interventions during CT-guided thrombolysis (pre-, intra-, and post-procedure) improved clinical outcomes and reduced adverse events(26). Nurses play a crucial role in early swallowing screening, stabilization of vital signs, and coordination of post-intervention care(27,28). Aspects of acute stroke nursing, such as pressure injury prevention, early mobilization, and continence care—emphasizing the holistic nature of nursing contributions even in the emergency context(29).

A prospective study in China (published in PMC) demonstrated that comprehensive nursing care before, during, and after CT-guided IV thrombolysis significantly reduced complication rates and improved patient satisfaction and clinical outcomes compared to routine care(30). A large retrospective cohort in Australia showed that establishing full-time stroke nursing teams, pre-notification systems, and structured protocols led to a reduction in median door-to-needle time from 73 to 49 minutes, with over 86% of patients receiving thrombolysis within the target 60-minute window(31). Meta-analyses on pressure injury prevention in stroke patients confirmed that intensive, evidence-based nursing interventions effectively reduce the incidence and delay the onset of skin ulcers, improving overall patient quality of life. A Delphi study in Thailand identified nursing outcome indicators specifically for thrombectomy care—including pre-, intra-, and post-procedure domains—emphasizing prevention of complications, neurological monitoring, and structured documentation by nurses(32).

These combined findings highlight that nursing interventions extend far beyond triage—they play an essential role across the emergency stroke care pathway. Nurse involvement in CT-guided thrombolysis, vital sign monitoring, dysphagia screening, mobilization, and pressure injury prevention contributes significantly to improved patient safety and outcomes. This holistic nursing care framework aligns with international stroke management guidelines, which advocate for comprehensive nursing protocols that begin in the emergency setting and continue through acute interventions into recovery phases.

Training and Simulation

One recurrent theme in the literature was the benefit of simulation-based training and continuing education for stroke nurses. Structured stroke education significantly enhanced nurses' adherence to clinical quality indicators(33). Similarly, international guidelines encouraged the development of training programs that build clinical decision-making capacity and improve response times. These findings are echoed in WHO's 2023 stroke strategy, which recommends systematic education for frontline nursing staff as a means to reduce geographic and systemic disparities in stroke outcomes—especially in low- and middle-income countries.

In Germany, the STREAM trial assessed interdisciplinary in-situ simulation training across several university hospitals. Post-intervention surveys showed significant improvements in patient safety climate (mean score increased from 3.34 to 3.56, p=0.028) and teamwork climate (3.76 to 3.84, p=0.001), with nurses reporting the greatest perceived benefit(34). Similarly, a network-wide implementation study showed that integrating simulation with structured stroke care algorithms substantially improved process times and staff cooperation across multiple hospitals(35). At a systems level, a recent meta-analysis (2024) demonstrated that simulation-based training significantly reduced door-to-needle time in acute stroke thrombolysis, and improved clinician confidence, communication, and adherence to protocols. However, the authors cautioned about heterogeneity among included studies and emphasized simulation training should be integrated alongside broader quality improvement strategies(36). Additional educational innovations include gamified NIHSS training, which increased engagement and frequency of training participation among paramedic students, and shortened simulated assessment time compared to traditional methods—suggesting potential scalability in resource-limited settings(37). Moreover, broader evidence from nursing education literature indicates that scenario-based simulation courses significantly enhance students' clinical skills, critical thinking, and confidence compared to traditional learning methods(38).

Taken together, this body of evidence affirms that simulation-based and structured training programs effectively prepare nurses for emergency stroke care. These interventions improve safety culture, interprofessional teamwork, protocol adherence, and clinical responsiveness—especially in initial hyperacute care settings.

Care Coordination and Communication

Effective interdisciplinary communication was another key area of nursing involvement. Nurses were found to be central in coordinating care during transitions—from ED to imaging, to stroke units, and even to post-discharge settings(18). Tools like SBAR and nurse-led checklists helped standardize

communication, which is essential for ensuring continuity and safety. Importantly, the review also identified nurses' role in patient and family communication, providing emotional support and guidance during critical decision-making periods. These functions, though often undervalued, are vital for ensuring informed consent, early rehabilitation planning, and adherence to treatment regimens.

Previous research, a quasi-experimental study demonstrated that an interprofessional communication training program led by nurses significantly improved knowledge and attitudes when caring for stroke patients with communication disorders; these gains persisted up to one year later, enhancing confidence and reducing frustration among nurses(39). A systematic review of nurse–family communication in ICU settings highlighted that effective, empathic communication strengthened relationship-centered care, eased family distress, and was instrumental in decision-making—underscoring parallels with nurses' communicative roles during acute stroke care(40). Evidence from Philippines-based community-care research shows that nurse-coordinated transitional care, involving family engagement and periodic evaluation, significantly improved post-discharge outcomes and enabled continuity across care settings(41). A mixed-methods evaluation of Structured Interdisciplinary Bedside Rounds (SIBR) revealed improved perceptions of communication, safety, teamwork, and job satisfaction among nurses, therapists, social workers, and others—highlighting how structured rounds facilitate both patient-centered communication and interdisciplinary alignment(42).

Taken together, these studies reinforce that effective care coordination and communication, led by nurses, are critical to patient safety, continuity, and family-centered outcomes. Standardized tools like SBAR and nurse-led rounds reduce information loss and clarify roles during transitions, while communication training enhances nurses' capacity to support vulnerable patients such as those with aphasia.

Gaps and Future Directions

Despite these strengths, a persistent gap was observed in many international guidelines, which often fail to delineate specific nursing responsibilities in early stroke care. This lack of nursing-specific language may contribute to underutilization or inconsistent implementation of nurse-led protocols, especially in settings without stroke-specialized personnel. To address this, there is an urgent need for nursing-focused clinical practice guidelines and implementation models tailored to diverse resource settings. Further, collaborative research is required to assess the effectiveness, cost-efficiency, and sustainability of nurse-led interventions across various emergency care contexts.

Despite the comprehensive approach of this review, it is limited by the exclusion of non-English articles and the potential for publication bias in available databases. Additionally, while this review mapped the scope of nursing interventions, it did not assess the quality or comparative effectiveness of each approach. Future studies should consider integrating quantitative evaluations and stakeholder perspectives to inform the development of robust, evidence-informed nursing protocols for emergency stroke care.

5. CONCLUSION

This scoping review highlights the multifaceted and essential role of nurses in the initial management of acute stroke in emergency departments. From rapid triage and neurological assessments to the implementation of structured care bundles and coordination across care transitions, nurses contribute significantly to timely and effective stroke care. The findings reveal that nurse-led interventions—such as FeSS protocols, early dysphagia screening, and simulation-based training—are associated with improved patient outcomes, reduced door-to-needle times, and better adherence to clinical guidelines. However, the review also underscores a critical gap in current international guidelines, many of which lack specific recommendations on nursing roles during the hyperacute phase of stroke. To address this, the development of context-adapted, nursing-specific protocols is imperative. Moreover, sustained investment in stroke-focused education and capacity building for nurses will be essential in optimizing emergency stroke care, particularly in resource-limited settings. By mapping existing evidence and recommendations, this review provides a foundation for strengthening the visibility and effectiveness of nursing interventions in stroke pathways and informs future research and policy directions.

6. ACKNOWLEDGMENTS

We thank the research team and librarian support for assisting with database search and document retrieval.

7. FUNDING

This study received no specific grant but was conducted as part of a funded institutional research roadmap.

8. CONFLICT OF INTEREST

The authors declare no conflict of interest.

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