SYSTEMATIC REVIEW

Outpatient follow-up of stroke patients: A systematic review

Zhonghua Hu[1], Hongyan Zhao[2], Tianhao Yu[3], Qingxin Gu[4], Yingxue Xi[5], Tian Ye[6], Rui Wang[7]

Abstract

Objective: To summarise the best evidence of outpatient follow-up of stroke patients, and to provide a reference for clinical practice.

Method: The current systematic review was conducted in November 2024 in China and comprised literature search done across a range of databases, including Guideline International Network, National Guideline Clearinghouse, China Guideline Clearinghouse, National Institute for Clinical Medicine, Joanna Briggs Institute Evidence-based Nursing Centre Library, Best Practice, Registered Nurses' Association of Ontario, PubMed, Excerpta Medica dataBASE, Web of Science, Cochrane Library, Chinese National Knowledge Infrastructure, WanFang Data and China Biology Medicine disc. The search targetted studies reporting data on the outpatient follow-up of patients with cerebral apoplexy.

Results: Of the 14 studies, 1(7.14%) involved clinical decision-making, 7(50%) were guidelines, and 2(14.28%) each were systematic reviews, expert consensus, and randomised controlled trials. The studies identified 33 best pieces of evidence across 6 categories for outpatient follow-up of stroke survivors after discharge.

Conclusions: The review summarised the best pieces of evidence and provided a reference for standardised outpatient follow-up for stroke patients.

Keywords: Stroke, Outpatient, Follow-up studies, Evidence-based nursing. (JPMA 75: 1109; 2025)

DOI: https://doi.org/10.47391/JPMA.30063

Introduction

Stroke is an acute cerebrovascular disease with a neurological deficit or disorder lasting more than 24 hours.[1] Every year, around 5.5 million new stroke cases are diagnosed in China alone.[2] About 75% of stroke survivors have varying degrees of motor dysfunction, and 50% have neurological sequelae.[3] In addition, stroke patients may experience emotional and social isolation, anxiety, and depression, which further increase the risk of readmission.[4] Indeed, studies show that about 28.8% of stroke survivors are readmitted within a month after discharge.[5]

The elevated readmission rates are intimately tied to several factors, including inadequate prevention and control systems, a scarcity of technical resources, an imbalance in stroke care specialisation, and insufficient support for healthcare professionals. Furthermore, these rates are also correlated with the aging demographic, unhealthy lifestyle habits, and widespread exposure to cardiovascular risk factors.[6] Consequently, bolstering hospital management systems tailored for stroke survivors and enhancing patients' self-management abilities are pivotal measures in reducing readmission rates.[7] Follow-up is an integral part of secondary prevention, as it can improve the ability of healthcare personnel to assess the condition, adjust the treatment plan in time, improve the quality of life of stroke patients, and improve their self-management awareness, thereby reducing the readmission rate and alleviating the burden of disease.[6] In recent years, with the standardisation and promotion of stroke prevention and care training, the importance of health management models for stroke and the significance of standardised follow-up have become increasingly prominent. The outpatient follow-up of stroke patients has become increasingly popular. Studies demonstrate that outpatient follow-up has good intervention and treatment effects and is associated with high data accuracy.[8,9] Therefore, improving the quality of follow-up in policies and guidelines is crucial to providing multidisciplinary outpatient follow-up services.[6,10] Specialised stroke health management clinics under the care of relevant consultants have been gradually established in some hospitals or regions, with positive results.[11-13] However, follow-up of such stroke patients generally lacks standardisation, scientific basis, and targetted approach. Currently, there is no consensus on the objectives, content, and leading personnel required to perform a satisfactory follow-up.[14] The current study was planned to comprehensively evaluate all relevant literature and to summarise the evidence to provide a basis for standardised outpatient follow-up of stroke patients after discharge.

[1,2]Department of Neurology, Huzhou Central Hospital, Affiliated Central Hospital of Huzhou University, Huzhou, China; [3-6]School of Medicine and School of Nursing, Huzhou Normal University, Huzhou, China; [7]Department of Cardiology, The Second Affiliated Hospital of Harbin Medical University, Harbin, China.

Correspondence: Hongyan Zhao. e-mail: hzfbfq@163.com

ORCID ID: 0009-0002-5349-8765

Submission complete: 15-01-2025 **1st Revision received:** 08-02-2025

Acceptance: 07-05-2025 **Last Revision received:** 06-05-2025

Materials and Methods

The current systematic review was conducted in November 2024 in China, and comprised literature search done across a range of databases, including Guideline International Network (GIN), National Guideline Clearinghouse (NGC), China Guideline Clearinghouse (CGC), National Institute for Clinical Medicine (NICE), Joanna Briggs Institute (JBI) Evidence-based Nursing Centre Library, Best Practice, Registered Nurses' Association of Ontario (RNAO), PubMed, Excerpta Medica database (EMBASE), Web of Science, Cochrane Library, Chinese National Knowledge Infrastructure (CNKI), WanFang Data and China Biology Medicine (CBM) disc.

The study was registered with the Evidence-Based Nursing Centre at Fudan University, China, and with the International Prospective Register of Systematic Reviews (PROSPERO)[15] (CRD420251026356). The actual start date of the process was later than the registered timeline because the research methodology was further refined before data collection.

Evidence-based questions were established in line with a 6-item model,[16] which included the following items: Target population (P)=post-discharge patients with stroke; Intervention (I)=outpatient follow-up; Professionals (P)= medical staff; Outcome (O)=readmission rate, quality of life, self-efficacy, etc; Setting (S)=outpatient clinic; Type of evidence (T)=best practice, guidelines, evidence summary, expert consensus, systematic review, meta-analysis, randomised controlled trial (RCT). The model is generally called PIPOST.[16] The search was carried out with the help of a set of Chinese key words and medical subject headings (MeSH), including cerebrovascular accident, stroke, secondary prevention, treatment, diagnosis and treatment, intervention, management, prevention and treatment, evidence-based, best practice, guidelines, evidence summary, expert consensus, systematic review, randomised controlled trial, etc. The English search terms were: stroke, intervention, management, guideline, recommendation, follow-up, systematic review, randomised controlled trial, evidence summary, best practice, etc. The search strategy used for the PubMed database was taken as an example (Table 1).

The studies included were complete guidelines, expert consensus, evidence summary, systematic reviews, and RCTs containing clear recommendations, comprising stroke patients aged at least 18 years, making recommendations regarding secondary prevention and management of stroke patients, and using the latest version of the revised guidelines. Studies from non-Chinese or English literature, direct translation of foreign guidelines or repeated publication, and those with incomplete guidelines, like summary or interpretation of guidelines, were excluded.

The Appraisal of Guidelines for Research and Evaluation II (AGREE II)[17] tool was used to evaluate the guidelines. Guidelines in which all six domains scored ≥60% were classified as Level A (strong recommendation). If at least three domains scored ≥30% and the rest of the domains scored <60%, the recommendation was classified as Level B (weak recommendation). Guidelines were classified as Level C (not recommended) if three or more domains scored ≤30%.

The systematic review was performed using the 2016 Australian JBI Evidence-based Health Care Centre assessment tool.[18] The standard contained 11 evaluation items, and the evaluators independently made "yes", "no", "unclear", and "not applicable" judgments for each item.

The methodological quality of the included RCTs was evaluated using the Australian JBI Evidence-Based Health Care Centre tool for authenticity evaluation of RCTs (2016).[18]

The quality of the incorporated expert consensus was assessed utilising the Expert Consensus Standard (2016).[18] This evaluation tool comprised six items, each capable of yielding judgments of 'yes', 'no', 'unclear', or 'not applicable'.

The quality evaluation of the best practice and evidence summary was traced back to the original literature, and the corresponding evaluation criteria were selected for evaluation according to different literature types.

Two researchers who were learning evidence-based nursing independently extracted the evidence. In case of disagreement, the third person, who had evidence-based research experience, made the final judgment. The inclusion principles followed were evidence-based priority, high-quality evidence priority, and the latest published authoritative literature priority. Principles of evidence summary and combination were clearly defined. When multiple evidence recommendations were not conflicting, they were merged into one evidence; when multiple evidence recommendations conflicted with each other, high-level, high-quality, and newly published evidence was adopted. When only one source of evidence was recommended, this evidence was adopted. If two pieces of evidence were conflicting, the latest published evidence was used. If only one piece of evidence was available, that piece of evidence was used.

Results

Of the 5,475 relevant articles initially identified, 14(0.25%) studies were included (Figure);[10,19-31] 1(7.14%) involved

clinical decision-making, 7(50%) were guidelines, 2(14.28%) each were systematic reviews, expert consensus, and RCTs (Table 2).

Of the 7(50%) guidelines, 4(57.14%) were in category A and 3(42.85%) were in category B (Table 3).

In the 2(14.28%) expert consensuses, for item 6, which asked, "Are there any inconsistencies between the proposed views and previous literature?", the answer was "no". For all the other items, the evaluation results were

Table 1: Search strategy.

# 1:	"Stroke"[MeSH];
# 2:	Poststroke*[Title/Abstract] OR cerebrovascular disorders*[Title/Abstract] OR cerebral apoplexy*[Title/Abstract] OR cerebral infarction*[Title/Abstract] OR brain ischemia* [Title/Abstract] OR cerebral ischemia* [Title/Abstract] OR ischemic stroke*[Title/Abstract];
# 3:	#1 OR #2;
# 4:	Secondary prevention [Title/Abstract] OR management [Title/Abstract] OR Outpatient follow-up [Title/Abstract] OR follow-up [Title/Abstract];
# 5:	"guideline" [Publication Type] OR "consensus"[Mesh] OR development, consensus [Title/Abstract] OR "clinical decision making" [Mesh] OR decision-making, clinical [Title/Abstract] OR medical decision-making [Title/Abstract] OR decision-making, medical [Title/Abstract] OR "systematic review"[Publication Type] OR review, systematic [Title/Abstract] OR "randomized controlled trial" [Publication Type] OR best practice [Title/Abstract] OR evidence summary [Title/Abstract];
# 6:	#3 AND #4 AND #5;

MeSH: Medical subject heading.

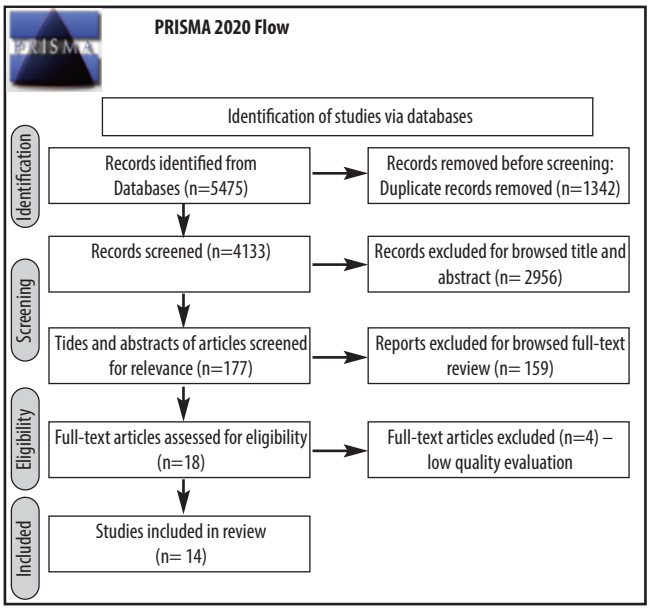

Figure: Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) flow diagram of literature search.

Table-2: General characteristics of the studies reviewed (n=14).

Authors	Year	Topic of literature	Sources	Genre
Karen LF et al.[18]	2023	An overview of secondary prevention of ischemic stroke	UpToDate	Clinical Decision Making
Neurosciences[19]	2020	Ischemic stroke management	Yimaitong.	Guide
Kernan W N et al.[20]	2021	Primary care for adults after stroke	Pubmed	Guide
General Office of the N.H.C.[21]	2021	Guidelines for prevention and treatment of stroke in China	National Stroke Center	Guidelines
Gladstone D J et al.[22]	2022	Canadian Stroke Best Practice Recommendations: Secondary Prevention of Stroke Update 2020	HSFC	Guidelines
Heran M et al.[23]	2022	Canadian Stroke Best Practice Recommendations: Acute Stroke Management, 7th Practice Guideline Update, 2022	HSFC	Guide
Zhang Tong et al.[24]	2023	Chinese Guidelines for the Clinical Management of Cerebrovascular Disease (2nd edition) (Excerpt) – Chapter 8 Rehabilitation Management of Cerebrovascular Disease	National Stroke Center	Guidelines
Min Lou et al.[10]	2023	Chinese Guidelines for the Clinical Management of Cerebrovascular Diseases (2nd edition) (Excerpt) – Chapter 2 Recommendations for the Organized Management of Stroke	National Stroke Center	Guidelines
Boehme C et al.[25]	2021	Management of long-term patients after stroke: a systematic review	Pubmed	Systematic review
Mead G E et al.[26]	2023	Systematic review and synthesis of global stroke guidelines on behalf of the World Stroke Organization	Pubmed	Systematic review
Huang Jiuyi et al.[27]	2017	Expert consensus on cerebrovascular health management and early prevention of stroke	CNKI	Expert consensus
Chang Liying et al.[28]	2021	Expert consensus on the popularization and education of stroke prevention and treatment	CNKI	Expert consensus
Markle-Reid et al.[29]	2023	Intervention of transitional care for stroke in elderly patients with stroke comorbidity: a randomized controlled trial	Pubmed	RCT
Schwarzbach et al.[30]	2023	A randomized controlled trial of post-stroke care protocols for patients with ischemic stroke	Pubmed	RCT

HSFC: , CNKI: , RCT: Randomised controlled trial; NHC: National Health Commission.

Table-3: Quality assessment of the guidelines (n=7).

Included literature	Standardized percentage in each field						≥60%	≥30%	Level of
	Range and Purpose	People involved	Rigor	Clarity	Applicability	Independence	Dimension number	dimensions	recommendation
Neurosciences[19]	93.06	87.50	84.90	97.22	86.46	95.83	6	6	A
Kernan W N et al.[20]	88.89	76.04	81.94	85.42	76.04	91.67	6	6	A
General Office of the N.H.C.[21]	79.17	68.06	63.54	98.61	56.25	43.75	4	6	B
Gladstone D J et al.[22]	93.06	83.33	75.52	98.61	89.58	100	6	6	A
Heran M et al.[23]	88.89	83.33	72.62	98.61	57.14	100	6	6	A
Zhang Tong et al.[24]	83.33	61.11	53.13	72.22	66.67	75.00	5	6	B
Lou Min et al.[10]	88.89	77.78	43.75	77.78	50.00	83.33	4	6	B

NHC: National Health Commission.

Table-4: Summary of the best evidence for outpatient follow-up in stroke patients.

Themes	Content of Evidence	Level of recommendation
Follow-up time, method, and personnel	1. Patients who need long-term treatment should be followed up once within 2 to 4 weeks after discharge and once every 3 months, 6 months, and 1 year after that	A A
	2. The core interdisciplinary stroke team should consist of healthcare professionals with expertise in stroke, including physicians, nurses, rehabilitation therapists, physical therapists, swallowing therapists, speech therapists, social workers, dietitians, pharmacists, patients, and families, among others	
	3. Ideally, the follow-up clinic would be available seven days a week	B
	4. At each visit, the patient's secondary prevention treatment plan adherence should be discussed and documented, non-adherence explored, counselling provided, and a plan jointly set	B
Health status	5. The patient's resting blood pressure should be measured and recorded, and if elevated (systolic blood pressure greater than 135mmHg and/or diastolic blood pressure greater than 85mmHg), a complete evaluation for the diagnosis of hypertension should be performed	B
	6. Patients with TIA and cerebral ischemia should be informed that blood pressure should be maintained consistently at below 140/90 mmHg. Patients with cerebral haemorrhage should maintain their blood pressure below 130/80 mmHg. In elderly patients aged 65-79 years, the blood pressure should be further reduced to < 150/90mmHg or < 140/90mmHg if tolerated. Blood pressure should be reduced to < 150/90 MMHG in elderly patients aged ≥80 years	B
	7. Patients with diabetes should be advised to take antihypertensive therapy to achieve blood pressure below 130/80mmHg	
	8. Patients with refractory hypertension should be comprehensively examined for secondary causes of hypertension	
	9. The blood glucose profile of stroke patients should be assessed and recorded, and Hba1c testing or glucose tolerance tests should be performed if necessary to identify diabetes or pre-diabetic states as early as possible	B
	10. Patients should be educated and advised to aim for an A1C of 7.0% or less to preventing microvascular complications	A
	11. Patients with diabetes should actively improve their lifestyle, control diet, strengthen physical activity, and take oral hypoglycaemic drugs or insulin if necessary	A
	12. The patient's serum lipid levels should be measured and recorded, and the patient should be advised and educated to have a low-density lipoprotein cholesterol level of <1.8mmol/L and to take medication if necessary	A
Administration of Medications	13. The patients' antithrombotic drugs should be recorded and evaluated, and blood routine, coagulation function, and other indicators should be detected	A
	14. A. Liver enzymes, muscle enzymes, and clinical symptoms such as myalgia should be evaluated and recorded in patients treated with high-intensity statins	B
	15. Referral for treatment in individuals with atherosclerotic cardiovascular disease who are unable to achieve target LDL levels should be considered	A
	16. Medication adherence in all oral anticoagulant patients should be continuously assessed and reinforced at each follow-up visit	B
	17. B. Assess and record whether the patient is taking sedative-hypnotic drugs, psychotropic drugs, or other medications	
	18. Patient and family education should be advised about medications and their side effects to promote adherence. Discharge planning should include meeting specific patient needs, such as individual dose packages, etc.	B B

Continued on next column

Table-4: *Continued from previous column.*

Themes	Content of Evidence	Level of recommendation
Exercise and rehabilitation	19. Patients with TIA or stroke should be educated to reduce sedentary behaviour and time and to increase the amount of activity they can tolerate as much as possible	A
	20. Stroke patients with coexisting conditions (e.g., heart disease) and risk of falls or injury should be screened, assessed, and monitored by healthcare providers during exercise and rehabilitation	B
	21. Individualized exercise intensity should be determined by exercise stress test and ECG	A
	22. Aerobic training should be initiated after a stroke or transient ischemic attack is stabilized. To ensure the continuity of appropriate interventions, patients should be reassessed at transition points in the continuum of care based on changes in neuromotor and cardiopulmonary capacity involved in aerobic training	B
	23. Patients with TIA or stroke should be encouraged to participate in aerobic exercise (e.g., brisk walking, jogging, swimming, cycling) 4 to 7 days per week, accumulating at least 150 minutes per week for 10 minutes or more	B
Living habits	24. Patients' smoking status should be identified, assessed, and documented (inpatient, outpatient, community, etc.)	A
	25. Clear, non-judgmental, and targeted counselling should be provided. All smokers (patients and family members living with the patients) should be advised to quit. Help in starting quit attempts - directly or through referral to appropriate resources-should be provided	A
	26. A combination of medication and behavioural therapy should be considered in all smoking cessation programs and interventions	A
	27. Comprehensive measures such as psychological counselling, nicotine replacement therapy, and oral smoking cessation drugs should be used to intervene for smokers, starting from smoking reduction to complete smoking cessation	B
	28. Patients should be advised to avoid heavy alcohol consumption, as excessive alcohol consumption can increase the risk of hypertension, ischemic stroke, and cerebral haemorrhage. Female patients should be advised to have no more than 10 drinks per week, no more than 2 drinks per day on weekdays, and no more than 3 drinks on any occasion. For male patients, no more than 15 drinks per week, no more than 3 drinks per day normally, and no more than 4 drinks on any occasion [the standard for a drink is about 44 ml (1.5 oz) of 80-degree (40%) spirits, 355 ml (12oz) of 5% beer, or 148 ml (5oz) of 12% wine] should be recommended	B
	29. Patients should be encouraged to follow a balanced dietary pattern such as the Mediterranean or Dietary Approaches to Stop Hypertension (DASH) diet. Consumption of highly processed foods should be reduced by eating a variety of natural, whole, and minimally processed foods at each meal.	B
	30. Waist circumference and body mass index (BMI) should be measured. Patients should be to achieve a waist circumference of < 88cm for women and < 102cm for men, or a BMI of 18.5 to 24.9kg/m2. Counseling and education should be provided for overweight patients to set healthy weight loss goals and develop personalized plans (e.g., diet plans, exercise plans, etc.)	B
Disease knowledge	31. The self-management ability of patients should be evaluated, and the family members and their caregivers should be given health education management for those with poor management	B
	32. The contents of education and counselling should include the aetiology of ischemic stroke, clinical manifestations, how to identify stroke recurrence, the hazards of ischemic stroke, individualized treatment goals, lifestyle intervention, characteristics of various treatment methods, clinical drug selection and use methods, etc	A
	33. A. Family members or caregivers should be guided to identify the occurrence and recurrence of stroke using "FAST", "Stroke 120", and "BEFAST" tools.	A

"yes". The research design was comprehensive, and the overall quality was high.

In the 2(14.28%) RCTs, all evaluation items were answered "yes". The study design was complete, and the quality of the literature was high.

After retrieval, the obtained evidence was analysed, evaluated, and summarized, resulting in 6 categories with 33 best pieces of evidence (Table 4).

Discussion

The current systematic review comprised all the existing high-quality best practices on the post-discharge outpatient follow-up of stroke survivors, providing a reference for developing standardised outpatient follow-up guidelines for this group of patients.

With the continuous improvement in the level of healthcare, the number of stroke survivors is gradually increasing. Therefore, there is a great need to develop high-quality guidelines for the health management of stroke survivors after discharge.[6,31] Follow-up is considered an important means of disease management. However, due to the variability of medical resource distribution and the lack of a scientific, systematic, and standardised follow-up system, the follow-up of stroke patients is often fragmented, with considerable differences among medical institutions.[32,33] The current results suggest that the outpatient follow-up of stroke survivors should comprehensively assess the health status, drug management, living habits, and exercise rehabilitation of the patients, and provide corresponding guidance. For patients with poor compliance, a follow-up should focus on disease education. In addition, a special electronic file should be established for follow-up patients to record the follow-up content, which should be regularly reviewed to ensure the standardisation and continuity of the follow-up.

The current results suggest that a structured outpatient follow-up team for stroke patients should be established. Several guidelines indicate that outpatient follow-up for stroke survivors should be provided by multidisciplinary teams that include doctors, nurses, rehabilitation therapists, physical therapists, speech therapists, social workers, nutritionists, pharmacists, etc. This will allow the achievement of standardised outpatient follow-up and health management through interdisciplinary collaboration.[31-33] However, research on the efficiency of multidisciplinary management of post-stroke patients is still limited, and trained professionals are relatively rare. Therefore, it is necessary to strengthen the training and improve the health assessment and exercise guidance levels of healthcare professionals treating stroke patients. At the same time, nurses, as indispensable members of the follow-up team, should be given leading roles in establishing interdisciplinary teams with stroke specialist nurses, health managers, or nurses with rich experience in stroke disease management as core to guide and encourage the patients to participate in outpatient follow-up. Additionally, they should coordinate with the professional medical staff to assess patients, formulate plans, implement interventions, and evaluate effects.

The current study evaluated the guidelines of various countries and concluded that implementing standardised long-term care follow-up should become an important part of stroke care.[23,33,34] However, the extent of the follow-up work varied among different places, making it challenging to ensure standardisation, continuity, and quality of follow-up and patient compliance. The online "Internet +" follow-up mode implemented in some areas has improved patient compliance to a certain extent. Still, the long-term compliance based on the online platform alone was unsatisfactory.[35] Since some patients with mild stroke symptoms are not aware of the importance of disease management, and do not strictly follow the requirements of health management to carry out standardised drug management, exercise, and lifestyle adjustment, their follow-up is often interrupted or missing. Therefore, health education should be carried out for patients before discharge, the importance of follow-up should be emphasised, and continuous supervision and health management should be carried out during follow-up to ensure compliance. In addition, in the process of follow-up evaluation, the health management strategies of patients can be adjusted flexibly and dynamically according to the actual state of the disease and personal habits. The type of exercise should be based on the patient's interests. Such personalised approaches that consider individual preferences would ultimately increase patient compliance.

The studies in the current review originated from multiple countries and encompassed diverse research designs. However, standardised assessment tools were used to systematically evaluate all methodological and substantive aspects, ensuring high therapeutic validity and rigour. Nevertheless, regional variations in climate, dietary habits, and lifestyle factors (e.g., sleep patterns and physical activity) may introduce some degree of heterogeneity in the evidence synthesis. To mitigate potential confounding effects, dietary assessment focused on quantitative analysis of specific food categories without restricting preparation methods, and physical activity evaluation adhered to internationally recognised guideline recommendations with broad applicability.

The current results may be affected by different regional,

racial, and cultural backgrounds. Besides, the findings are based on the current Chinese and English studies for which full text was available, limiting generalisability. However, it did encompass the majority of relevant studies, thus ensuring that the findings are both thorough and reliable. When putting these findings into practice in clinical nursing, several challenges may emerge. Patient preferences might clash with evidence-based recommendations, making it essential for healthcare providers to communicate effectively to facilitate informed decision-making. Additionally, there are differences in outpatient clinics of hospitals in various countries, and the different medical levels of hospitals in different regions of China, which may have impacted the current findings. Further studies with standardised follow-up guidelines are needed to validate the findings.

Conclusions

There were 33 best pieces of evidence for outpatient follow-up of stroke survivors after discharge. These were spread over six categories: follow-up time, methods and personnel; health status; drug management; exercise and rehabilitation; living habits; and disease knowledge. The findings emphasised the importance of multidisciplinary teams and a personalised approach to generate effective and standardised outpatient follow-up strategies when translating evidence into clinical practice. The findings may facilitate the development of structured outpatient follow-up after discharge, improve health management of the disease, and reduce the readmission rate of stroke survivors after discharge from the hospital.

Disclaimer: None.

Conflict of Interest: None.

Source of Funding: The Medicine and Health Project, Zhejiang, China, and the Postgraduate Research and Innovation Project, Huzhou University, China.

References

1. Markus H. Stroke: causes and clinical features. Medicine (Baltimore) 2008;36:586–91. doi: 10.1016/j.mpmed.2008.08.009.
2. Li S, Chen R, Zhang L, Li H, Gong Y, Hang Y, et al. Relationships between quality of discharge teaching, readiness for hospital discharge, self-efficacy and self-management in patients with first-episode stroke: a cross-sectional study. J Clin Nurs 2024;33:1–12. doi: 10.1111/jocn.17481.
3. Lin X, Wang H, Rong X, Huang R, Peng Y. Exploring stroke risk and prevention in China: insights from an outlier. Aging (Albany NY) 2021;13:15659–73. doi: 10.18632/aging.203096.
4. Abreu P, Magalhães R, Baptista D, Azevedo E, Silva MC, Correia M. Readmissions and mortality during the first year after stroke—data from a population-based incidence study. Front Neurol 2020;11:636. doi: 10.3389/fneur.2020.00636.
5. Wen T, Liu B, Wan X, Zhang X, Zhang J, Zhou X, et al. Risk factors associated with 31-day unplanned readmission in 50,912 discharged patients after stroke in China. BMC Neurol 2018;18:218. doi: 10.1186/s12883-018-1209-y.
6. Wu S, Wu B, Liu M, Chen Z, Wang W, Anderson CS, et al. Stroke in China: advances and challenges in epidemiology, prevention, and management. Lancet Neurol 2019;18:394–405. doi: 10.1016/S1474-4422(18)30500-3.
7. Bin J. Suggestions for domestic primary stroke care arising from epidemiological characteristics, prevention and treatment of stroke in China. Chin Gen Pract 2019;22:3653. doi: 10.12114/j.issn.1007-9572.2019.00.445.
8. Bilicki DJ, Reeves MJ. Outpatient follow-up visits to reduce 30-day all-cause readmissions for heart failure, COPD, myocardial infarction, and stroke: a systematic review and meta-analysis. Prev Chronic Dis 2024;21:e74. doi: 10.5888/pcd21.240138.
9. Tyagi S, Koh GCH, Luo N, Tan KB, Hoenig H, Matchar DB, et al. Role of caregiver factors in outpatient medical follow-up post-stroke: observational study in Singapore. BMC Fam Pract 2021;22:74. doi: 10.1186/s12875-021-01405-z.
10. Lou M, Ding J, Hu B, Zhang Y, Li H, Tan Z, et al. Chinese Stroke Association guidelines for clinical management of cerebrovascular disorders: executive summary and 2019 update on organizational stroke management. Stroke Vasc Neurol 2020;5:260–9. doi: 10.1136/svn-2020-000355.
11. Jenkins L, Gonzaga S, Jedlanek E, Kim G, Raghavan P. Addressing the operational challenges for outpatient stroke rehabilitation. Am J Phys Med Rehabil 2023;102(Suppl 1):s61–7. doi: 10.1097/PHM.0000000000002145.
12. Olasoji EB, Uhm DK, Awosika OO, Doré S, Geis C, Simpkins AN. Trends in outpatient rehabilitation use for stroke survivors. J Neurol Sci 2022;442:120383. doi: 10.1016/j.jns.2022.120383.
13. Sanjuan E, Pancorbo O, Santana K, Miñarro O, Sala V, Muchada M, et al. Management of acute stroke: specific nursing care and treatments in the stroke unit. Neurologia 2023;38:419–26. doi: 10.1016/j.nrleng.2020.07.026.
14. Reig-Garcia G, Cámara-Liebana D, Suñer-Soler R, Pau-Perich E, Sitjar-Suñer M, Mantas-Jiménez S, et al. Assessment of standardized care plans for people with chronic diseases in primary care settings. Nurs Rep 2024;14:801–15. doi: 10.3390/nursrep14020062.
15. National Institute for Health and Care Research (NIHR). PROSPERO—International prospective register of systematic reviews. [Online] 2025 [Cited 2025 April 30]. Available from URL: https://www.crd.york.ac.uk/prospero/.
16. Zhu Z, Hu Y, Xin W, Zhou Y, Gu Y. Composition of different types of evidence-based problems. J Nurses Train 2017;32:1991–4. doi: 10.16821/j.cnki.hsjx.2017.21.025.
17. Brouwers MC, Kho ME, Browman GP, Burgers JS, Cluzeau F, Feder G, et al. AGREE II: advancing guideline development, reporting and evaluation in health care. CMAJ 2010;182:e839–42. doi: 10.1503/cmaj.090449.
18. The Joanna Briggs Institute (JBI). Critical Appraisal Tools. [Online] 2025 [Cited 2025 April 30]. Available from URL: https://jbi.global/critical-appraisal-tools.
19. Rost NR, Simpkins AN. Overview of secondary prevention of ischemic stroke. [Online] 2025 [Cited 2025 April 30]. Available from URL: https://www.uptodate.com/contents/overview-of-secondary-prevention-of-ischemic-stroke.
20. Neurosciences MSO. Management of ischaemic attack. [Online] 2025 [Cited 2025 April 30]. Available from URL: https://guide.medlive.cn/guideline/24065.
21. Kernan WN, Viera AJ, Billinger SA, Bravata DM, Stark SL, Kasner SE, et al. Primary care of adult patients after stroke: a scientific statement from the American Heart Association/American Stroke Association. Stroke 2021;52:e558–71. doi: 10.1161/STR.0000000000000382.

22. Guidelines for Stroke Prevention and Treatment in China. Beijing, China: The People's Health Press Co, Ltd. [Online] 2025 [Cited 2025 April 30]. Available from URL: https://www.zhangqiaokeyan.com/book-cn/081503389083.html.
23. Gladstone DJ, Lindsay MP, Douketis J, Smith EE, Dowlatshahi D, Wein T, et al. Canadian Stroke Best Practice Recommendations: Secondary Prevention of Stroke Update 2020. Can J Neurol Sci 2022;49:315–37. doi: 10.1017/cjn.2021.127.
24. Heran M, Lindsay P, Gubitz G, Yu A, Ganesh A, Lund R, et al. Canadian Stroke Best Practice Recommendations: Acute Stroke Management, 7th Edition Practice Guidelines Update, 2022. Can J Neurol Sci 2024;51:1–31. doi: 10.1017/cjn.2022.344.
25. Zhang T, Zhao J, Li X, Bai Y, Wang B, Qu Y, et al. Chinese Stroke Association guidelines for clinical management of cerebrovascular disorders: executive summary and 2019 update of clinical management of stroke rehabilitation. Stroke Vasc Neurol 2020;5:250–9. doi: 10.1136/svn-2019-000321.
26. Boehme C, Toell T, Lang W, Knoflach M, Kiechl S. Longer term patient management following stroke: a systematic review. Int J Stroke 2021;16:917–26. doi: 10.1177/17474930211016963.
27. Mead GE, Sposato LA, Sampaio Silva G, Yperzeele L, Wu S, Kutlubaev M, et al. A systematic review and synthesis of global stroke guidelines on behalf of the World Stroke Organization. Int J Stroke 2023;18:499–531. doi: 10.1177/17474930231156753.
28. Editorial Board of the Chinese Journal of Health Management, Chinese Medical Association Health Management Branch, National Cerebrovascular Disease Prevention and Research Office. Expert consensus of cerebrovascular health management and early prevention of stroke. Chin J Health Manag 2017;11:397–407. doi: 10.3760/cma.j.issn.1674-0815.2017.05.002.
29. Chang L, He X, Chao X. Expert consensus on science popularization and education on stroke prevention and treatment. Stroke Nerv Dis 2021;28:713–8.
30. Markle-Reid M, Fisher K, Walker KM, Beauchamp M, Cameron JI, Dayler D, et al. The stroke transitional care intervention for older adults with stroke and multimorbidity: a multisite pragmatic randomized controlled trial. BMC Geriatr 2023;23:687. doi: 10.1186/s12877-023-04403-1.
31. Schwarzbach CJ, Michalski D, Wagner M, Winkler T, Kaendler S, Elstner M, et al. Position paper on stroke aftercare of the German Stroke Society—Part 3: structural concepts for future forms of care of stroke aftercare. Nervenarzt 2022;93:385–91. doi: 10.1007/s00115-021-01230-w.
32. Wang YJ, Li ZX, Gu HQ, Zhai Y, Zhou Q, Jiang Y, et al. China Stroke Statistics: an update on the 2019 report from the National Center for Healthcare Quality Management in Neurological Diseases, China National Clinical Research Center for Neurological Diseases, the Chinese Stroke Association, National Center for Chronic and Non-communicable Disease Control and Prevention, Chinese Center for Disease Control and Prevention and Institute for Global Neuroscience and Stroke Collaborations. Stroke Vasc Neurol 2022;7:415–50. doi: 10.1136/svn-2021-001374.
33. Hotter B, Ikenberg B, Kaendler S, Knispel P, Ritter M, Sander D, et al. Position paper on stroke aftercare of the German Stroke Society—Part 2: concept for a comprehensive stroke aftercare. Nervenarzt 2022;93:377–84. doi: 10.1007/s00115-021-01232-8.
34. Duncan PW, Bushnell C, Sissine M, Coleman S, Lutz BJ, Johnson AM, et al. Comprehensive stroke care and outcomes: time for a paradigm shift. Stroke 2021;52:385–93. doi: 10.1161/STROKEAHA.120.029678.
35. Logan AG, Irvine MJ, McIsaac WJ, Tisler A, Rossos PG, Easty A, et al. Effect of home blood pressure telemonitoring with self-care support on uncontrolled systolic hypertension in diabetics. Hypertension 2012;60:51–7. doi: 10.1161/HYPERTENSIONAHA.111.188409.

Author Contribution:
ZH: Design the study and writing.
HZ: Data collection, performed data analysis and editing.
TY, GQ, YX, TY & RW: Data collection and performed data analysis.