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Nursing care for a client with cerebral infarction in an Indonesian regional stroke unit: A descriptive case study

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Abstract:
Ischemic stroke is a leading cause of death and disability in Indonesia, and acute-phase nursing care shapes recovery. This study aimed to describe the nursing care process for a client with cerebral infarction and to identify gaps between evidence-based standards and clinical practice in a regional stroke unit. A qualitative descriptive single-case study was conducted in the stroke unit of Dr. Soedomo Regional General Hospital, Trenggalek, Indonesia. Data were collected through interviews, observation, physical examination, and medical record review, and were analyzed deductively across the five phases of the nursing process. A 64-year-old woman presented with dysarthria, right-sided hemiparesis, dizziness, and a blood pressure of 149/92 mmHg. Three nursing diagnoses were established: risk for ineffective cerebral perfusion, impaired physical mobility, and impaired verbal communication. After three days of care, headache decreased and blood pressure reached 126/72 mmHg, whereas dysarthria and motor weakness persisted. Gaps were identified in history taking, sensory and cognitive assessment, cranial nerve examination, and the use of standardized stroke scales. Nursing care stabilized cerebral perfusion but had limited short-term effects on mobility and communication. Structured neurological assessment and early rehabilitation should be strengthened in regional stroke units.

Keywords:
cerebral infarction; ischemic stroke; nursing process; stroke unit; case study

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INTRODUCTION

Stroke remains the second leading cause of death and the third leading cause of combined death and disability worldwide. In 2021, an estimated 11.9 million new strokes, 93.8 million prevalent cases, and 7.3 million stroke-related deaths occurred globally, and the burden was concentrated in low- and middle-income countries (GBD 2021 Stroke Risk Factor Collaborators, 2024). Ischemic stroke, caused by the occlusion of a cerebral artery, is the most common type (Campbell et al., 2019; Martin et al., 2024). The World Stroke Organization estimates that one in

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four adults will experience a stroke during their lifetime, which makes stroke care a priority for every health system (Feigin et al., 2022).

Indonesia carries a heavy share of this burden. Stroke is the leading cause of death in the country, and national survey data show a prevalence of 10.9 per 1,000 people aged 15 years and older (Venketasubramanian et al., 2022). Stroke services, however, remain unevenly distributed. Specialized stroke units and neurology staff are concentrated in large urban centers, while many district and regional hospitals still work with limited personnel, equipment, and standardized protocols (Venketasubramanian et al., 2022). In these settings, nurses are often the professionals who spend the most time with patients and who carry most of the responsibility for continuous monitoring.

When a cerebral artery is blocked, brain tissue in the core of the territory dies quickly, while the surrounding penumbra remains at risk and can be saved if perfusion is maintained (Campbell et al., 2019). Clinical signs depend on the affected area and commonly include hemiparesis, facial asymmetry, dysarthria or aphasia, sensory loss, and dysphagia. These deficits affect almost every basic human need, from breathing and eating to moving, communicating, and maintaining self-care (Afandi et al., 2026). Nursing care in the acute phase therefore covers neurological monitoring, blood pressure and glucose management, positioning, swallowing screening, prevention of complications, early mobilization, and support for communication and family involvement (Green et al., 2021; Theofanidis & Gibbon, 2016).

Good nursing care makes a measurable difference. Organized stroke unit care reduces death and dependency compared with care in general wards (Langhorne & Ramachandra, 2020). In a cluster randomized trial, nurse-led protocols for fever, hyperglycemia, and swallowing dysfunction reduced death and dependency at 90 days (Middleton et al., 2011). International guidelines describe these practices in detail (Powers et al., 2019; Winstein et al., 2016). Even so, translating guidelines into bedside practice remains difficult. Indonesian studies have shown that the completeness of initial nursing assessments varies with ward leadership (Putri et al., 2021) and that routine monitoring of vital signs is closely related to the level of consciousness in stroke patients (Fauzi et al., 2022). Such findings suggest that the quality of assessment and monitoring may differ considerably between hospitals.

Case studies are useful for showing how care unfolds in real clinical contexts and for revealing where practice departs from standards (Crowe et al., 2011). Nursing case studies conducted in Indonesian hospitals have used this approach to examine medication safety and clinical routines in detail (Afandi et al., 2024). Yet few published reports from regional Indonesian stroke units describe the full nursing process for a client with cerebral infarction and compare it with evidence-based standards. This information is needed to guide training and quality improvement where resources are limited.

Therefore, this study aimed to describe the nursing care process, from assessment and diagnosis to intervention, implementation, and evaluation, for a client with cerebral infarction in a regional stroke unit in East Java, Indonesia, and to identify gaps between evidence-based standards and clinical practice.

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METHODS

This study used a qualitative descriptive single-case study design. A case study approach allows an in-depth exploration of a phenomenon in its natural clinical context (Crowe et al., 2011). The nursing process (assessment, diagnosis, planning, implementation, and evaluation) served as the analytical framework, and the report was prepared in accordance with the CARE guidelines for case reports (Riley et al., 2017). The study was conducted in the Stroke Unit of Dr. Soedomo Regional General Hospital, Trenggalek, East Java, Indonesia, a government referral hospital for the district, between 10 March and 17 April 2025. The participant was selected purposively. The inclusion criteria were: (1) adult with a medical diagnosis of cerebral infarction documented in the medical record, (2) hemodynamically stable and treated in the stroke unit, (3) able to respond to questions, or accompanied by a family member able to provide information, and (4) willing to participate. Clients with hemorrhagic stroke or reduced consciousness requiring intensive care were excluded. One 64-year-old woman met the criteria and received nursing care from the researcher for three consecutive days, together with the ward nursing team.

Data were collected through four methods. First, semi-structured interviews with the client and her family explored the onset of symptoms, medical and family history, risk factors, and daily functional needs. Second, direct observations of the client and nursing activities were recorded on a structured observation sheet. Third, a head-to-toe and neurological physical examination was performed using inspection, palpation, percussion, and auscultation. Vital signs were measured with a calibrated sphygmomanometer, a digital thermometer, and a pulse oximeter. Fourth, medical records, laboratory reports, medication charts, and nursing notes were reviewed. Nursing diagnoses, expected outcomes, and interventions were formulated in accordance with the Indonesian Nursing Diagnosis, Outcome, and Intervention Standards (SDKI, SLKI, and SIKI) issued by the Indonesian National Nurses Association.

Data were analyzed using deductive thematic analysis (Braun & Clarke, 2006). Data from all sources were read repeatedly, coded, and organized into the five phases of the nursing process. Each phase was then compared with evidence-based recommendations for acute ischemic stroke care (Green et al., 2021; Powers et al., 2019) to identify areas of congruence and gaps. Clinical outcomes were evaluated by comparing the client's condition on admission with her condition on the third day of care. Credibility was strengthened through data triangulation across the client, family, nurses, medical records, and direct observation. Key findings were confirmed with the client, her family, and the nurse in charge. An audit trail of field notes and documentation was maintained, and the analysis was discussed with academic supervisors through peer debriefing. Written informed consent was obtained from the client and her family after the study's purpose and procedures were explained. Participation was voluntary, and all identifying information was removed to protect confidentiality.

RESULTS

The client was a 64-year-old woman admitted to the stroke unit with a medical diagnosis of cerebral infarction. She was referred to the unit after the sudden onset of slurred speech (dysarthria), weakness of the right arm and leg (right-sided hemiparesis), dizziness, and headache.

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On admission, her blood pressure was 149/92 mmHg, pulse rate 95 beats per minute, respiratory rate 20 breaths per minute, temperature 37.0 °C, and oxygen saturation 99%. Medical therapy included citicoline and ranitidine.

Based on the assessment data, three nursing diagnoses were established: (1) risk for ineffective cerebral perfusion related to hypertension, (2) impaired physical mobility related to decreased muscle strength, and (3) impaired verbal communication related to dysarthria. Table 1 summarizes the supporting data, the main nursing interventions, and the evaluation on the third day of care.

Table 1. Nursing diagnoses, interventions, and evaluation after three days of care

Nursing diagnosis	Supporting data	Main nursing interventions	Evaluation (day 3)
Risk for ineffective cerebral perfusion related to hypertension	Sudden dysarthria and right hemiparesis; dizziness and headache; BP 149/92 mmHg; pulse 95 bpm	Neurological and vital sign monitoring; observation for signs of raised intracranial pressure; bed rest with head elevated 15–30°; quiet environment; administration of citicoline and ranitidine as prescribed	Headache decreased; BP 126/72 mmHg; no neurological deterioration; problem partly resolved, monitoring continued
Impaired physical mobility related to decreased muscle strength	Weakness of right arm and leg; dependent on others for movement and self-care	Repositioning; passive and active range-of-motion exercises; assistance with daily activities; fall prevention; family involvement in exercises	Moderate weakness persisted; still required assistance; problem not yet resolved, intervention continued
Impaired verbal communication related to dysarthria	Slurred speech; difficulty expressing words clearly	Short, simple questions; extra time to respond; speech exercises; use of gestures; family support in communication	Speech remained slurred; basic needs communicated with help; problem not yet resolved, intervention continued

Note: BP = blood pressure; bpm = beats per minute.

After three days of nursing care, the first diagnosis showed the clearest improvement. The client's headache decreased, and her blood pressure gradually fell from 149/92 mmHg to 126/72 mmHg, with no signs of neurological deterioration. The other two problems were only partly resolved. Weakness in the right limbs remained moderate, so the client still needed help with mobility and daily activities. Her speech also remained slurred, although she was able to communicate basic needs with the help of simple questions and her family. The care plan was therefore continued, with ongoing monitoring of cerebral perfusion, medication therapy as prescribed, and continued mobility and communication exercises.

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Table 2. Gaps between evidence-based standards and observed nursing practice

Aspect of care	Evidence-based standard	Observed practice
History taking	Detailed onset time, symptom progression, risk factors, and medication history (Powers et al., 2019)	Recorded briefly; risk factors and onset details incomplete
Sensory and cognitive assessment	Systematic assessment of sensation, orientation, attention, and memory (Green et al., 2021)	Not performed systematically
Cranial nerve examination	Assessment of facial, swallowing, and speech-related cranial nerves to guide safety and communication plans (Green et al., 2021)	Not performed systematically; swallowing screening not documented
Stroke severity scale	Use of a standardized scale such as the NIHSS on admission and at regular intervals (Kwah & Diong, 2014)	No standardized scale documented
Nursing documentation	Structured records of neurological, functional, and educational outcomes (Green et al., 2021)	Focused on vital signs and medication; functional changes described in general terms

Note: NIHSS = National Institutes of Health Stroke Scale.

The comparison between standards and practice showed several gaps, mainly in the assessment phase (Table 2). The history of the present illness and risk factors were recorded only briefly. Sensory function, cognitive status, and cranial nerves were not examined systematically, and no standardized stroke severity scale was documented. Nursing documentation focused on vital signs and medication administration, while functional and neurological changes were described in general terms.

DISCUSSION

This case study described the nursing care of an older woman with cerebral infarction in a regional Indonesian stroke unit. Three main findings emerged. First, care focused on cerebral perfusion was followed by a reduction in headache and a stable decrease in blood pressure. Second, impaired mobility and impaired verbal communication improved little within three days. Third, the assessment phase revealed clear gaps relative to evidence-based standards, particularly in neurological examination and the use of standardized tools.

The improvement in the perfusion problem is encouraging, but it needs careful interpretation. In acute ischemic stroke, blood pressure often rises as a natural response that helps maintain blood flow to the penumbra. For patients who do not receive reperfusion therapy, guidelines advise against lowering blood pressure in the first 48 to 72 hours unless it exceeds 220/120 mmHg (Powers et al., 2019). Rapid or excessive reduction may worsen ischemia (Bath et al., 2022). In this case, the admission blood pressure was 149/92 mmHg, which was moderate, and it gradually decreased to 126/72 mmHg without neurological worsening. Nurses should nonetheless understand these targets clearly, because they are the first to notice changes and to report them. Regular monitoring of vital signs is also important because changes in vital signs are associated with level of consciousness in stroke patients and can serve as early warning signs (Fauzi et al., 2022).

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Head positioning is another practice that deserves attention. The unit used head elevation of 15–30°, which is common in Indonesian hospitals and is often taught to reduce intracranial pressure. However, a large international trial found that lying flat and sitting up at 30° or more produced similar outcomes in patients with acute stroke (Anderson et al., 2017). Head position should therefore be individualized. Elevation remains reasonable for patients at risk of aspiration or with signs of raised intracranial pressure, but it should not be seen as a treatment that improves perfusion in every patient. The decrease in headache in this case was probably influenced by several factors, including rest, a quiet environment, blood pressure stabilization, and medication.

Medication management is also part of nursing care. The client received citicoline, a drug that is widely used in Indonesia. However, a large, randomized trial did not find that citicoline improved recovery after moderate to severe ischemic stroke (Dávalos et al., 2012). The nurse's role here is not to decide on therapy but to ensure safe administration, monitor for side effects, and discuss the evidence with the team. Consistently applying the principles of correct drug administration is an important safety measure in this process (Afandi et al., 2024).

Limited improvement in mobility after three days was expected. Motor recovery after stroke usually takes weeks to months and depends on early, regular, and goal-directed rehabilitation (Langhorne et al., 2011; Winstein et al., 2016). The interventions given in this case, including repositioning, range-of-motion exercises, and help with daily activities, are consistent with recommendations to prevent contractures, pressure injuries, and falls (Theofanidis & Gibbon, 2016). Timing and dose also matter. A large trial showed that very early, high-dose mobilization within 24 hours of stroke onset led to poorer outcomes than usual care (AVERT Trial Collaboration group, 2015). Short, frequent mobilization sessions, initiated when the patient is stable and adjusted to tolerance, are therefore recommended. Nurses are well placed to deliver these sessions throughout the day and to involve physiotherapists early.

Communication remained a problem at the end of the care period. Dysarthria affects how clearly a person speaks, while aphasia affects language itself. The two conditions need different approaches, so a careful assessment of speech, language, and the related cranial nerves is essential. Evidence on specific therapies for dysarthria after stroke is still limited (Mitchell et al., 2017), whereas speech and language therapy for aphasia has shown benefits, particularly when given at higher intensity (Brady et al., 2016). In daily practice, nurses support communication by speaking slowly, asking simple questions, giving enough time to answer, and using gestures or writing. These simple strategies reduce frustration, help patients express their needs, and support participation in rehabilitation. Referral to a speech therapist should be made whenever available.

The most important finding of this study is the gap in assessment. History-taking was brief, and sensory, cognitive, and cranial nerve examinations were not performed systematically. No standardized severity scale was documented. The NIHSS is a short and reliable tool that nurses can be trained to use, and it helps the team detect deterioration and plan care consistently (Kwah & Diong, 2014). Without a structured assessment, important problems may be missed. Dysphagia is a clear example. Swallowing screening, together with fever and glucose management, was a key part of the nurse-led protocol that reduced death and dependency in the QASC trial (Middleton et al., 2011). Gaps in assessment and documentation are not only individual problems. In Indonesian hospitals, the completeness of nursing assessment has been linked to ward leadership and

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organizational support (Putri et al., 2021). Assessment organized around the patient's basic human needs can also help nurses see the person rather than focusing solely on vital signs (Afandi et al., 2026).

The family played an important role in this case, particularly in supporting communication and exercises. This is consistent with evidence that training caregivers during hospitalization can reduce caregiver burden and improve quality of life without increasing costs (Kalra et al., 2004). In Indonesia, families usually stay with patients during hospitalization and continue care at home, so structured family education should be part of the nursing plan from the first day.

Another important consideration is the transition from acute stroke management to rehabilitation and discharge planning. Although neurological stabilization is the immediate priority, early planning can help prevent complications and maintain continuity of care. Nurses should assess the patient's ability to perform daily activities, identify risks of falls and aspiration, and coordinate rehabilitation based on the patient's neurological status and tolerance. Family members should receive practical instruction on safe transfers, positioning, communication, medication adherence, and warning signs that require urgent medical attention. In regional hospitals where access to rehabilitation services may be limited, clear discharge instructions and referral arrangements are particularly important to support recovery beyond hospitalization.

These findings have practical implications for regional hospitals. Stroke unit care is effective because it brings organized teams, protocols, and early rehabilitation together (Langhorne & Ramachandra, 2020). Regional units can strengthen this effect by using a simple nursing pathway that includes standardized neurological assessment, swallowing screening, clear blood pressure targets, individualized positioning, early mobilization, and communication support (Green et al., 2021). Regular in-service training, supervision, and documentation audits may help close the gap between standards and practice, especially where specialist staff are limited (Venketasubramanian et al., 2022).

This study has several limitations. It involved a single client and a short care period of three days, so the findings cannot be generalized to other patients or settings. Outcomes were described clinically, without standardized measures such as muscle strength grading, the NIHSS, or a functional independence scale. In addition, the researcher was involved in providing care, which may have influenced observation. Future studies should include more clients, use standardized outcome measures, and follow patients from admission to discharge and home care.

Evaluation should also extend beyond changes in individual symptoms or vital signs. A patient-centered assessment can capture changes in functional independence, communication, swallowing safety, and participation in daily activities. Standardized measures, including the NIHSS for neurological impairment and an appropriate functional scale for activities of daily living, can establish a baseline and support consistent reassessment. Combining these measures with nursing documentation and family feedback may help the care team identify unmet needs and adjust interventions. Although the present case did not include standardized outcome measurements, incorporating them into future nursing case reports could improve the transparency, reproducibility, and clinical usefulness of reported outcomes.

CONCLUSION

This case study shows that nursing care for a client with cerebral infarction in a regional stroke unit successfully stabilized cerebral perfusion, as evidenced by reduced headache and controlled blood pressure, but had limited short-term effects on mobility and verbal communication. The main gap between standards and practice was in assessment, including incomplete history-taking, unsystematic sensory, cognitive, and cranial nerve examinations, and the absence of a standardized stroke scale. Strengthening structured neurological assessment, early rehabilitation, and family involvement is needed to improve the quality of stroke nursing care in regional hospitals.

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