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Original Article

Application of FAST in patient with ischemic stroke and risk for ineffective cerebral perfusion: A nursing case study

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Abstract

Background: Stroke is a neurological disorder frequently associated with reduced cerebral perfusion and impaired consciousness. While conventional interventions are widely implemented, their effectiveness may be enhanced by evidence-based approaches such as Familiar Auditory Sensory Training (FAST), a non-pharmacological intervention that utilizes meaningful auditory stimuli to activate neural pathways and support consciousness recovery.
Objective: This study aims to evaluate the effectiveness of FAST in addressing the nursing problem of risk for ineffective cerebral tissue perfusion in an ischemic stroke patient.
Methods: A case study was conducted involving a 73-year-old male patient in a soporous state. FAST was administered over three consecutive days, three times daily, with each session lasting 10 minutes. Data were collected through direct observation and Glasgow Coma Scale (GCS) measurements before and after each session. Patient outcomes were evaluated using the Nursing Outcomes Classification (NOC), focusing on indicators including consciousness level, blood pressure, and agitation.
Results: The patient's level of consciousness improved from sopor (6) to somnolence (9). Improvements were also noted in blood pressure, heart rate, and respiratory rate, although an increase in restlessness was observed. FAST supported cerebral responsiveness and cognitive function recovery, contributing to the resolution of the nursing problem: risk for ineffective cerebral tissue perfusion.
Conclusion: FAST can be utilized as a therapeutic nursing intervention to enhance hemodynamic stability in patients with decreased consciousness.

Background

Stroke remains a leading cause of mortality and long-term disability worldwide, with a substantial burden on public health systems. Globally, approximately 15 million individuals suffer from stroke each year, with 5 million deaths and another 5 million left with permanent disabilities (World Health Organization (WHO), 2025). In Indonesia, the prevalence of stroke reached 638,178 individuals, predominantly affecting males, and in East Java Province, 98,738 cases were recorded (Badan Kebijakan Pembangunan Kesehatan, 2023).

This high prevalence underscores the critical role of nurses in early detection, continuous monitoring, and implementation of evidence-based interventions aimed at minimizing neurological deterioration and promoting recovery (Faried et al., 2023). From a nursing perspective, addressing complications such as impaired consciousness requires not only medical management but also integrative, non-pharmacological strategies that optimize cerebral function and patient outcomes (Othman et al., 2020).

One of the critical clinical consequences of stroke is decreased consciousness due to impaired cerebral perfusion. Ischemic strokes, which occur due to obstruction of cerebral blood flow, can result in neuronal dysfunction, altered sensorimotor response, and in severe cases, coma (Siva Safira et al., 2024). Ineffective cerebral tissue perfusion is a priority nursing diagnosis in such cases, as it increases the risk of cerebral edema, elevated intracranial pressure (ICP), and potential brain herniation, which can be life threatening (Wida et al., 2024).

Conventional stroke management often emphasizes pharmacological and surgical interventions. However, non-pharmacological approaches are increasingly explored to support neurobehavioral recovery. One such method is Familiar Auditory Sensory Training (FAST), a therapeutic intervention involving personalized auditory stimuli from familiar voices. FAST aims to stimulate sensory and emotional pathways in the brain to enhance arousal and consciousness in patients with impaired awareness (Aripratiwi et al., 2020). FAST works by activating the auditory cortex, which transmits sensory input to the limbic system and reticular activating system (RAS) key regions that regulate emotion, memory, and wakefulness. Familiar auditory cues trigger emotional memory and stimulate the RAS, promoting cortical activation and maintaining arousal. This neural stimulation enhances synaptic activity and cerebral perfusion, facilitating recovery of consciousness in patients with ischemic brain injury.

Previous studies have reported promising outcomes of FAST in improving Glasgow Coma Scale (GCS) scores over short durations of intervention (Mohammadi et al., 2017; Siva Safira et al., 2024). The auditory stimulation involved in FAST activates the limbic system and reticular activating system (RAS), facilitating memory recall and emotional engagement even in non verbal patients (Wida et al., 2024). However, most existing studies have primarily focused on FAST application in patients with traumatic brain injury or generalized disorders of consciousness, with minimal exploration in ischemic stroke populations. Furthermore, limited evidence addresses how FAST can be applied within the scope of nursing diagnoses particularly ineffective cerebral tissue perfusion which is critical to stroke nursing care.

To date, no study has specifically explored the implementation of FAST in ischemic stroke patients from a nursing perspective, particularly in relation to the management of ineffective cerebral tissue perfusion. Highlighting this gap is essential, as it underscores the need for nursing-led, evidence-based interventions that integrate sensory and emotional stimulation to enhance cerebral perfusion and consciousness recovery.

This study therefore seeks to address this research gap by evaluating the effectiveness of FAST in improving consciousness in an ischemic stroke patient with a nursing diagnosis of risk for ineffective cerebral perfusion. The findings are expected to contribute novel evidence supporting the integration of FAST into stroke nursing practice, especially as a non-invasive and nurse led intervention complementing conventional medical management.

Case Report

A 73-year-old Javanese male with a past medical history of uncontrolled hypertension and asthma. On June 11, 2025, he experienced an asthma exacerbation. After partial improvement, he returned to his farmland under the intense midday sun on June 14. On his way home, he experienced shortness of breath and was caught in heavy rain, which, according to his family, further deteriorated his condition. Due to the persistence of his symptoms, his family brought him to a primary healthcare facility at 09:00 AM on June 17, which was his first visit to a healthcare facility.

Due to limited oxygen supply in the inpatient unit, he was treated in the Emergency Department (ED) for 24 hours. On June 18 at approximately 03:00 AM, the patient urinated independently but then suddenly became extremely weak. He was referred from the primary healthcare facility to a hospital, arriving at the emergency department at approximately 01:00 PM presenting with decreased consciousness. Initial evaluation noted a sopor state, and the physician diagnosed Disorder of Consciousness (DoC) with a suspicion of cerebrovascular accident (susp. CVA). In the ED, he underwent electrocardiography (ECG), blood and urine sampling, fluid resuscitation, and injection therapy.

Later that same day, at 6:00 PM, the patient was transferred to an inpatient ward. On the second day of hospitalization, June 19, 2025, further assessment revealed a GCS score of E2V2M2, blood pressure of 152/90 mmHg, mean arterial pressure (MAP) of 111 mmHg, pulse pressure of 62 mmHg, heart rate of 137 beats/minute, respiratory rate of 40 breaths/minute (irregular), and oxygen saturation (SpO_2) of 89% on 7 L/min via a simple mask. Pupil response was sluggish, and capillary refill time exceeded 3 seconds. He was also found to be at high risk of falls with a Morse Fall Scale score of 80.

Laboratory test (Table 1) revealed anemia with low hemoglobin (12.3 g/dL), hematocrit (38.7%), and erythrocyte count ($4.16 \times 10^6/\mu L$). Mild macrocytosis was observed (MCV 93.0 fL), with normal MCH (29.6 pg) and slightly reduced MCHC (31.8 g/dL). Leukocytosis was noted ($21.8 \times 10^3/\mu L$) with neutrophilic predominance (segmented neutrophils 94%) and markedly low lymphocytes (3%) and monocytes (2%). The neutrophil-to-lymphocyte ratio (NLR) was significantly elevated at 34.43 (normal < 3.13), indicating a strong inflammatory response. Platelet count was within normal range ($320 \times 10^3/\mu L$), while erythrocyte sedimentation rate (ESR) was elevated (46 mm/hr), supporting the presence of systemic inflammation. Electrolyte panel showed normal levels of sodium (135 mmol/L), potassium (4.18 mmol/L), and chloride (99.0 mmol/L). Renal function was preserved with normal serum creatinine (1.0 mg/dL).

Upon admission to the ward, the patient was placed under close observation and received targeted pharmacological and supportive interventions for stroke and comorbid asthma. The patient received a comprehensive pharmacological regimen targeting cerebral, respiratory, and systemic support. Intravenous treatments included 0.9% NaCl at 1500 cc per 24 hours for fluid maintenance, Mannitol 125 cc four times daily as an osmotic diuretic to reduce cerebral edema, and Aminophylline (½ ampoule, six times daily) for bronchodilation and respiratory support. Levofloxacin 500 mg once daily was administered as an antibiotic for infection management, Methylprednisolone 62.5 mg twice daily as an anti-inflammatory agent, and Omeprazole 40 mg once daily to prevent gastrointestinal complications. Oral medications given via nasogastric tube included Bricolot® (5 tablets twice daily) for respiratory therapy, Aspilet® (1 tablet daily) as an antiplatelet agent, and Cilostazol® 100 mg twice daily to enhance cerebral circulation.

Supportive care consisted of oxygen therapy at 7 L/min via a simple face mask to maintain adequate oxygen saturation. Neurological monitoring involved frequent Glasgow Coma Scale (GCS) assessments, pupillary examinations, and capillary refill time (CRT) evaluation. Fall prevention strategies were implemented due to the patient's high-risk status, including raised side rails and adherence to safety protocols. Airway management and proper positioning were performed to reduce aspiration risk and optimize respiratory function.

These interventions were aimed at stabilizing the patient’s condition, preventing further neurological decline, and providing a basis for further therapeutic and rehabilitative care.

Table 1. Laboratory test results

Component	Result	Reference Range	Interpretation
Hemoglobin	12.3 g/dL	13.5-17.5	L
Hematocrit	38,7%	41-53	L
Erythrocytes	4.16 10^6/uL	4.5-5.5	L
Mean Corpuscular Volume (MCV)	93.0 fL	82.00-92.00	H
Mean Corpuscular Hemoglobin (MCH)	29.6 pg	27.00-31.00	N
Mean Corpuscular Hemoglobin Concentration (MCHC)	31.8 g/dL	32.00-37.00	L
Leukocytes	21.8 10^3/uL	4.5-11.0	H
Eosinophils	0%	0-3	N
Basophils	1%	0-1	N
Band Neutrophils	0		N
Segmented Neutrophils	94		N
Lymphocytes	3%	24-44	L
Monocytes	2%	3-6	L
Neutrophil-to-Lymphocyte Ratio (NLR)	34,43	<3.13	H
Platelets (Thrombocytes)	320 10^3/uL	3-6	N
Erythrocyte Sedimentation Rate (ESR)	46/- mm/hour		N
Sodium	135 mmol/L	135-155	N
Pottasium	4.18 mmol/L	3,5-50,0	N
Chloride	99.0 mmol/L	90-110	N

*L: Low, N: Normal, H:High

Methods

Study Design

This study employed a single-subject case study with a quantitative descriptive approach to evaluate the effect of Familiar Auditory Sensory Training (FAST) on the consciousness level of a stroke patient. The intervention was conducted over three consecutive days and focused on assessing changes in the Glasgow Coma Scale (GCS) score as the primary outcome.

Sampling

The study was conducted using a purposive selection technique in a single inpatient ward at a hospital in the Jember area. One participant, a 73-year-old male patient diagnosed with ischemic stroke and a Glasgow Coma Scale (GCS) score of ≤ 8, was selected based on inclusion criteria adapted from established protocols by (Mohammadi et al., 2017; Patil et al., 2012). These criteria included: (1) a confirmed diagnosis of stroke with reduced consciousness (GCS ≤ 8), (2) absence of ear damage or discharge, (3) no known history of hearing impairment, and (4) legal guardian approval and informed consent.

In addition, the individual chosen to provide the familiar voice stimulus met the following requirements: had known the patient for more than one year prior to the incident, had regular and meaningful interactions with the patient, and expressed emotional readiness and willingness to participate in the intervention. This ensured the authenticity and emotional relevance of the auditory input used during the Familiar Auditory Sensory Training (FAST) sessions.

Instruments

Standard Operating Procedure (SOP) were applied to guide both the assessment of consciousness using the Glasgow Coma Scale (GCS) and the implementation of Familiar Auditory Sensory Training (FAST). The SOP for GCS ensured standardized evaluation of the patient's neurological status before and after each intervention session, while the SOP for FAST provided a structured protocol for the consistent delivery of auditory stimulation, ensuring adherence to therapeutic guidelines and enhancing the reliability of the intervention.

Additionally, intracranial pressure (ICP) was estimated using a non-invasive calculation method adapted from Kasahara et al. (2018), applying the following formula: ICP = (0.44 × BMI) + (0.16 × diastolic BP) − (0.18 × age) − 1.91. This approach allowed for indirect monitoring of cerebral pressure trends associated with changes in consciousness.

Intervention

The intervention consisted of FAST administered over three consecutive days (June 19–21, 2025). three times daily with each session lasting 10 minutes. The three-day duration was selected based on previous studies demonstrating measurable changes in consciousness following short-term auditory stimulation and to ensure patient safety and tolerance during intervention. The stimulus used was a pre-recorded voice message delivered by a close family member, divided into three segments as adapted from Mohammadi et al. (2017): 1)A brief introduction explaining the time and incident that led to hospitalization (1 minute), 2) A narrative of shared meaningful memories (4 minutes), and 3) Encouraging words and hopeful messages for recovery (5 minutes). Recordings were played near the patient's ear using a portable speaker due to initial refusal of in ear devices.

Data Collection

Observational data were recorded before and after each intervention session. Clinical parameters including GCS, systolic and diastolic blood pressure, MAP, respiratory rate, pulse, oxygen saturation, and ICP were documented. Subjective responses such as facial gestures, verbal attempts, and physical movements were also noted.

Data Analysis

Data were analyzed descriptively to observe trends and changes in the patient's physiological and neurological responses over the intervention period. Pre and post intervention scores were compared for each session to assess any improvements in consciousness and hemodynamic stability. Outcome measures aligned with the SLKI indicator Cerebral Perfusion (L.02014) and nursing diagnostic goals based on PPNI standards (Tim Pokja SLKI DPP PPNI, 2018).

Ethical Consideration

The study was conducted in accordance with ethical standards for human research. Informed consent was obtained from the patient's family. Ethical approval was obtained from the institutional review board of a hospital located in the Jember region, with documentation supporting the use of personalized auditory stimuli for therapeutic purposes. Patient and family confidentiality were maintained throughout the study.

Results

This study aimed to evaluate the effectiveness of Familiar Auditory Sensory Training (FAST) on consciousness level and hemodynamic stability in a patient diagnosed with ischemic stroke and decreased awareness. The intervention was conducted for three consecutive days, with a total of nine sessions. The outcomes were assessed using Glasgow Coma Scale (GCS), blood pressure, MAP, pulse, respiratory rate, SpO_2, and calculated ICP values. The evaluation also included behavioral responses such as restlessness (See Table 2).

Table 2. Trends of physiological and neurological parameters during the 3 day FAST intervention

Parameter	Day 1	Day 2	Day 3
GCS Score	6	8	9
MAP (mmHg)	112	99	97
Blood Pressure (bpm)	150/93	125/86	127/82
Heart Rate (bpm)	137	120	128
Pulse Pressure (mmHg)	58	39	45
SpO2 (%)	90	99	99
RR (/min)	40	33	30
ICP (mmHg)	9,74	8,62	7,98

A progressive increase in the patient's GCS score was observed over the intervention period. The patient's level of consciousness improved from sopor (E2V2M2) to somnolence (E3V3M3), indicating better arousal and responsiveness to auditory stimuli.

As shown in Table 3, the most significant improvement occurred after the second day, when the patient responded verbally with recognizable syllables and showed flexion withdrawal to pain.

Table 3. Change in Glasgow Coma Scale (GCS) Scores Over Three Days

Date	Eye (E)	Verbal (V)	Motorik (M)	GCS Total	Consciousness Level
19 June (Pre)	2	2	2	6	Sopor
19 June (Post)	2	2	2	6	Sopor
20 June (Pre)	2	2	2	6	Sopor
20 June (Post)	2	3	3	8	Somnolence
21 June (Pre)	2	3	3	8	Somnolence
21 June (Post)	3	3	3	9	Somnolence

A reduction in both systolic and diastolic blood pressure was documented post intervention, aligning with improved MAP values. These findings suggest a potential calming effect of FAST, contributing to hemodynamic stability, see Table 4. Improvements in blood pressure are notable especially on the third day, with values approaching physiological normal ranges.

ICP values were calculated using the formula by Kasahara et al. (2018). The ICP remained within a normal physiological range (5–15 mmHg) throughout the intervention and gradually declined. A mild increase was noted after the first day, but a consistent decline followed, indicating improved cerebral perfusion and lower cerebral stress, (Table 5.)

Table 4. Changes in Blood Pressure and MAP Pre- and Post-FAST

Date	Systolic (mmHg)	Diastolic (mmHg)	MAP (mmHg)
19 June (Pre)	152	90	111
19 June (Post)	150	93	112
20 June (Pre)	130	89	103
20 June (Post)	125	86	99
21 June (Pre)	130	90	103
21 June (Post)	127	82	97

Table 5. Intracranial Pressure (ICP) Trend Over Time

Date	Pre	Post
19 June 2025	9,26 mmHg	9,74 mmHg
20 June 2025	9,10 mmHg	8,62 mmHg
21 June 2025	9,26 mmHg	7,98 mmHg

The patient's restlessness was scored according to SLKI indicators. Over three days, a slight reduction in anxiety was observed.

Table 6. Restlessness Scores Based on Clinical Observation

Date	Pre	Post
19 June 2025	3	3
20 June 2025	4	4
21 June 2025	4	4

Assessment using SLKI outcomes showed that the patient's restlessness increased during the three-day FAST intervention. On the first day, the restlessness score was 3 and increased to 4 on the second and third days (Table 6).

Measurements of pulse pressure (systolic - diastolic) and heart rate indicated better autonomic regulation after repeated FAST sessions. Pulse pressure and heart rate changes before and after FAST indicated a hemodynamic response. On June 19, pulse pressure dropped from 62 to 57 mmHg, with heart rate unchanged at 137 bpm. On June 20, both values slightly decreased. By June 21, pulse pressure rose from 40 to 45 mmHg, while heart rate declined from 130 to 128 bpm, suggesting cardiovascular stabilization following FAST, (Table 7).

Table 7. Pulse Pressure and Heart Rate Trends

Date	Pulse Pressure		Heart Rate	
	Pre	Post	Pre	Post
19 June 2025	62 mmHg	57 mmHg	137x/menit	137x/menit
20 June 2025	41 mmHg	39 mmHg	122x/menit	120x/menit
21 June 2025	40 mmHg	45 mmHg	130x/menit	128x/menit

SpO_2 improved slightly, while respiratory rate decreased gradually, indicating improved ventilation. The combination of oxygen therapy and relaxation induced by FAST may have contributed to enhanced respiratory performance.

Overall, the intervention demonstrated a positive impact on neurological status, hemodynamic stability, and behavioral response. Improvements in GCS scores, ICP reduction, and cardiovascular parameters provide preliminary support for the use of FAST as a therapeutic nursing intervention in stroke patients with reduced consciousness (Table 8.)

Table 8. Respiratory and Oxygenation Parameters

Date	RR		SpO2	
	Pre	**Post**	**Pre**	**Post**
19 June 2025	40x/menit	40x/menit	89%	90%
20 June 2025	35x/menit	33x/menit	99%	99%
21 June 2025	31x/menit	30x/menit	99%	99%

Discussion

In this study, the administration of Familiar Auditory Sensory Training (FAST) over a three-day period resulted in a notable improvement in the consciousness level of a patient with ischemic stroke, evidenced by a change in the Glasgow Coma Scale (GCS) score from sopor (6) to somnolence (9). Pharmacological therapy was also administered to support neurological recovery, including mannitol to reduce intracranial pressure, cilostazol to enhance cerebral blood flow, and aminophylline, a bronchodilator with mild central nervous system stimulant effects.

This combination was intended to optimize cerebral perfusion and facilitate neurological stimulation to promote recovery of consciousness. Alongside this improvement, an increase in the patient's restlessness was observed, reflected in a rise in the Nursing Outcomes Classification score from 3 to 4. This phenomenon may be interpreted as a manifestation of central nervous system mobilization during the process of regaining consciousness (Wijnen et al., 2006).

The heightened restlessness may indicate early arousal, as the limbic system responsible for processing emotional and memory-related stimuli is activated in response to familiar auditory input. FAST stimulates both the limbic system and the ascending reticular activating system, reinforcing arousal and enhancing awareness (Bender Pape et al., 2020). This mechanism may enable the reactivation of subconscious communication pathways, particularly in patients unable to express themselves verbally (Efremov, 2024). Previous studies have consistently demonstrated the effectiveness of FAST in improving consciousness in stroke patients (Aripratiwi et al., 2020; Putri & Purwanti, 2025). From a nursing perspective, this highlights the importance of sensory-based interventions as part of comprehensive care for patients with decreased consciousness. Nurses can apply FAST as a non-invasive, family-centered approach to stimulate arousal and maintain patient–family connection even when verbal communication is limited

From a hemodynamic perspective, notable changes in vital signs were observed throughout the intervention. The patient received 125 mL of mannitol four times over two days, which contributed to a decrease in blood pressure from 152/90 mmHg to 130 mmHg and a reduction in mean arterial pressure (MAP) from 111 mmHg to 103 mmHg. Intracranial pressure remained within normal limits, dropping from 9.25 mmHg to 1.98 mmHg. Initially, the patient presented with a widened pulse pressure of 62 mmHg and a heart rate of 137 bpm; by the final day, the heart rate had decreased to 128 bpm with a narrowed pulse pressure of 45 mmHg. While these changes indicate clinical improvement, the target outcomes were not fully met, consistent with the patient's moderate level of consciousness (GCS 9). Taranikanti et al. (2023) proposed that auditory stimulation may induce relaxation by modulating prefrontal cortex activity, which plays a crucial role in suppressing sympathetic nervous system output. Accordingly, FAST may contribute to clinically meaningful reductions in blood pressure through neurophysiological regulation. This is further supported by findings from Irman (2023), who reported that auditory stimulation significantly decreased systolic and diastolic blood pressure and heart rate in patients with acute stroke. These effects are believed to be mediated by increased endorphin release, which promotes relaxation and reduces sympathetic nervous system activity, thereby supporting hemodynamic stability. Clinical evidence also indicates that auditory stimulation therapy can progressively reduce pain, blood pressure, and heart rate over the course of several intervention days, contributing to overall physiological optimization.

In line with this, Faozi et al. (2021) observed that multimodal sensory stimulation influences sympathetic activity and brain metabolism, which are physiologically linked to neurovegetative function and autonomic system stability. Sympathetic activation may thus support overall clinical recovery, including the stabilization of hemodynamics, particularly in patients with impaired consciousness. For nursing practice, these findings imply that FAST can be integrated as a safe and simple complementary intervention to support hemodynamic stability. Nurses should monitor the patient's tolerance and adapt stimulation intensity based on changes in vital signs to ensure physiological safety.

In terms of oxygenation, the combination of FAST with oxygen therapy via a simple mask at 7 L/min produced favorable outcomes. The patient's respiratory rate decreased from 40 to 30 breaths per minute, while oxygen saturation improved from 89% to 99% by the third day. This improvement may be partially attributed to enhanced consciousness, which facilitates voluntary respiratory control and airway reflexes. However, despite achieving the target SpO_2 level, the respiratory rate remained elevated, likely due to the patient's consciousness not yet reaching an optimal level. This finding aligns with results from Singhal et al. (2005), which demonstrated that neurological improvement may occur soon after the initiation of high-flow oxygen therapy, although autonomic functions do not necessarily recover at the same pace. This suggests that respiratory centers in the brain may remain impaired despite improved tissue oxygenation. Additionally, Wijnen et al. (2006) reported that autonomic nervous system reactivity to sensory stimulation increases in parallel with consciousness recovery, reflecting physiological improvements in respiratory function and oxygen regulation. Accordingly, FAST can serve as a non-pharmacological nursing intervention to support oxygenation improvement by modulating autonomic responses and promoting sympathetic activation in patients with impaired consciousness. From a nursing viewpoint, this underlines the importance of comprehensive monitoring during sensory therapy. Improved oxygenation should be interpreted alongside neurological and respiratory assessments, as nurses play a key role in coordinating supportive care and evaluating responses to FAST interventions.

Overall, the integration of FAST into nursing care plans demonstrates potential benefits in improving consciousness, stabilizing hemodynamics, and supporting oxygenation in ischemic stroke patients. These findings reinforce the nursing role in providing holistic, non-pharmacological, and family-involved interventions that complement medical management and enhance patient recovery.

This study has several limitations. As a single case report, the findings cannot be generalized to all stroke patients. Additionally, the intervention period was limited to three days, which may not fully capture the long-term effects of FAST on consciousness and hemodynamic stability. Future studies involving larger samples and longer intervention durations are recommended to confirm these preliminary findings.

Conclusion and Recommendation

This study demonstrates that Familiar Auditory Sensory Training (FAST) can enhance consciousness and physiological stability in a stroke patient with impaired cerebral perfusion. Clinically, these findings emphasize the nursing role in applying sensory-based and family-involved interventions as part of holistic stroke care. FAST represents a non-invasive, low-cost approach that may support cerebral perfusion and neurological recovery. Further studies with larger samples are recommended to validate its effectiveness and develop standardized nursing protocols.

Future studies with larger samples of ischemic stroke patients are warranted to validate these results. FAST is expected to be a feasible nursing intervention that offers a non-invasive and cost-effective approach to enhancing cerebral perfusion.

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Declaration of conflict of interest

The authors declare no competing interests.

Declaration on the Use of AI

AI-assisted tools such as Grammarly were used to support language editing during the preparation of this manuscript. The authors have reviewed and take full responsibility for the content.

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