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HEALTH-RELATED QUALITY OF LIFE TRAJECTORIES AFTER ACUTE STROKE: A 90-DAY PROSPECTIVE LONGITUDINAL COHORT STUDY

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- **Overall HRQoL improved significantly over 90 days.**
- **Recovery differed substantially across SIS domains.**
- **Participation, hand function, and mobility showed the greatest gains.**

OVERALL SIS SCORE
57.9 → 68.0 → 81.3
T0 → 30 d → 90 d

MEAN CHANGE T0→T2
+16.3
(95% CI: 12.7–19.9; p<0.001)

REACHED MCID BY DAY 90
38.5%
of patients (n = 52)

INTRODUCTION

- Stroke is a leading cause of long-term disability. Clinical and functional outcomes describe deficit and dependency, but not how survivors experience recovery.
- The first 90 days carry the most rapid neurological and functional change and the key rehabilitation decisions, so repeated stroke-specific HRQoL measurement is needed rather than a single snapshot.
- Longitudinal, stroke-specific HRQoL data from Viet Nam and comparable LMIC settings remain scarce; most evidence is cross-sectional or uses generic instruments.

OBJECTIVE

To evaluated changes in HRQoL during the first 90 days after stroke using the Vietnamese Stroke Impact Scale 3.0 (V-SIS 3.0), and to identify factors associated with these changes.

METHODS

Design Prospective longitudinal cohort study

Setting Thong Nhat Hospital, Ho Chi Minh City, Viet Nam

Period March – June 2025

Sample 187 patients with acute stroke
(ischaemic stroke or intracerebral haemorrhage)

INCLUDED

- Adults aged ≥18 years
- Acute ischemic stroke or intracerebral hemorrhage confirmed clinically and by neuroimaging
- Able to complete the assessment directly or with caregiver communication assistance
- Written informed consent

EXCLUDED

- Transient ischaemic attack
- Severe pre-existing cognitive or psychiatric disorder interfering with completion
- Terminal illness, survival < 3 months
- Declined participation

ASSESSMENT TIMEPOINTS

T0 — ADMISSION — 48–72 h after admission — Bedside interview — **N = 187**
→
T1 — 30 DAYS — 30 ± 5 days — Telephone or in person — **N = 111**
→
T2 — 90 DAYS — 90 ± 7 days — Telephone or in person — **N = 52**

Data collection: identical questionnaire at every timepoint, trained data collectors, standardised protocol. Where communication was impaired, a primary caregiver/proxy could assist under guidance.
Follow-up completion at day 90: 52/187 (27.8%).

VIETNAMESE STROKE IMPACT SCALE 3.0 (V-SIS 3.0)

stroke-specific HRQoL

59	8	0–100	higher = better
items	domains	standardised	

1 · Strength	2 · Memory & Thinking
3 · Emotion	4 · Communication
5 · ADL / IADL	6 · Mobility
7 · Hand Function	8 · Social Participation

Overall SIS = mean of the eight domain scores. The global **Stroke Recovery** item is reported separately.

Psychometric properties in Vietnamese stroke populations: Cronbach's α 0.859–0.983 across domains; 8-factor structure explaining 79.2% of total variance; convergent validity with EQ-5D-5L (total SIS r = 0.718; physical domain r = 0.743).

MCID DEFINITION - Change in overall SIS score

Δ ≥ +15 points	Improvement
−15 < Δ < +15 points	Stable
Δ ≤ −15 points	Worsening

An alternative 10-point threshold was examined in sensitivity analysis.

COVARIATES CONSIDERED

Sociodemographic
age · sex · education · marital status · socioeconomic status · physical activity · smoking · alcohol

Clinical
Stroke type · length of stay · onset-to-admission time · BMI · prior stroke · family history · complications

Comorbidity
Hypertension · diabetes · dyslipidaemia

Treatment
Antiplatelet · anticoagulant · thrombolytic · anti-oedema · antihypertensive · statin · hypoglycaemic

→ HRQoL TRAJECTORY

STATISTICAL ANALYSIS

Primary analysis
- Linear mixed-effects model for repeated overall SIS scores
- Time modeled categorically: T0, T1 and T2
- Patient-specific random intercept
- Adjustment for prespecified sociodemographic, clinical, comorbidity and treatment covariates

Domain-level analysis
- Time, domain and time-by-domain interaction
- Random intercepts for patient and patient-by-domain
- Estimated marginal means and adjusted within-domain contrasts

Sensitivity analyses
- Complete-case analysis
- Multiple imputation
- Inverse probability of censoring weighting
- Alternative time specifications and MCID threshold

Software
- R 4.3.2 · Two-sided α = 0.05

BASELINE COHORT (N = 187)

Characteristic	Value
Age, Mean (SD), years	**64.4 (15.8)**
Male	**58.8%**
Primary to high-school education	**68.4%**
Economic status: well-off / average / low-poor	**63.6 / 11.8 / 24.6%**
Length of stay, median (IQR), days	**7.0 [5.5–8.0]**
Hypertension	**78.6%**
Dyslipidaemia	**75.4%**
Diabetes	**43.9%**
Prior stroke	**25.1%**
Low physical activity	**47.1%**

Also recorded: BMI (obese 29.9%, overweight 18.7%, normal 41.7%, underweight 9.6%), family history of stroke/CVD 39.6%, post-stroke complication 8.6%, smoking 23.5%, alcohol use 24.6%.

RESULTS

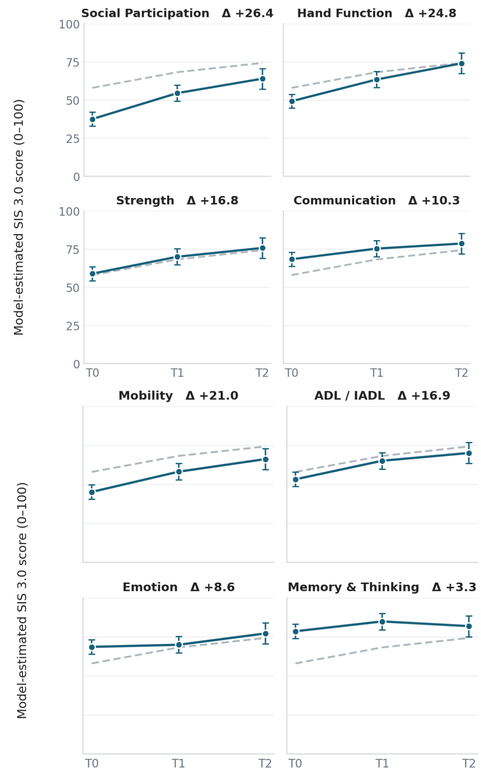
Observed SIS 3.0 domain and total scores

SIS 3.0 Domain	T0 (Admission) N=187	T1 (30 days) N=111	T2 (90 days) N=52
Strength	59.4 (25.4)	69.4 (25.8)	80.3 (22.1)
Memory/Thinking	79.0 (34.1)	84.8 (28.6)	86.5 (28.7)
Emotion	69.0 (25.2)	69.3 (26.6)	82.9 (22.8)
Communication	68.8 (40.1)	76.2 (35.3)	87.2 (28.4)
ADL/IADL	53.7 (40.2)	65.4 (36.0)	80.4 (33.9)
Mobility	45.6 (37.4)	59.0 (37.8)	76.9 (33.3)
Hand Function	49.7 (41.6)	63.7 (40.4)	80.7 (32.8)
Social Participation	38.0 (34.2)	56.2 (37.5)	75.5 (32.3)
Stroke Recovery	34.5 (26.0)	50.4 (26.0)	68.4 (24.5)
Total SIS Score	57.9 (28.4)	68.0 (24.9)	81.3 (27.2)

Values are presented as mean (SD). SIS scores range from 0 to 100, with higher scores indicating better health-related quality of life. ADL = activities of daily living; HRQoL = health-related quality of life; IADL = instrumental activities of daily living; SIS = Stroke Impact Scale.

Recovery was heterogeneous across domains

The time-by-domain interaction was significant (χ^2=65.0; df=14; p<0.001).
The largest 90-day gains were observed in Social Participation, Hand Function, and Mobility.



Recovery differed significantly across SIS domains, with the greatest gains in Social Participation, Hand Function, and Mobility. Memory and Thinking showed the smallest change (+3.3 points).

Clinically meaningful change in overall SIS score

Total SIS score, ±15-point threshold

38.5% of participants achieved a ≥15-point improvement by day 90

Factors associated with overall SIS score

Primary linear mixed-effects model · 187 participants · 350 observations
Adjusted β (95% CI), SIS points · Marginal R^2 = 0.331 · Conditional R^2 = 0.878

CHANGE OVER TIME — REF: T0

Variable	Adjusted β (95% CI)	p-value
T1 — Day 30	+10.26 (7.63 to 12.89)	<0.001
T2 — Day 90	+16.29 (12.71 to 19.87)	<0.001

ASSOCIATED FACTORS

Variable	Adjusted β (95% CI)	p-value
Ischemic vs intracerebral hemorrhage	+22.80 (11.17 to 34.43)	<0.001
Hospital stay, per additional day	−1.91 (−3.08 to −0.74)	0.001
Average vs well-off economic status	+17.81 (4.48 to 31.15)	0.009
Anticoagulant use	−14.78 (−27.39 to −2.17)	0.022

Higher overall SIS scores
Associated with ischemic stroke and average economic status.

Lower overall SIS scores
Associated with longer hospitalization and anticoagulant use.

β represents the adjusted difference in overall SIS score. Positive estimates indicate higher scores and negative estimates indicate lower scores. Associations should not be interpreted as causal; the anticoagulant estimate may reflect confounding by indication.

Attrition & limitations

187 at baseline → 111 at 30 d → 52 at 90 d

Only 52 participants completed all three assessments. Participants with day-90 data had higher baseline SIS scores than those without day-90 data (65.7 vs 54.9; p=0.020), indicating potential attrition bias.

Key limitations: substantial attrition; absence of baseline NIHSS and mRS; single-center setting; and follow-up limited to 90 days.

CONCLUSIONS

1. HRQoL improved significantly and progressively from admission through 90 days after acute stroke.
2. Recovery was heterogeneous: Social Participation, Stroke Recovery, Mobility and Hand Function showed the largest absolute gains, whereas Memory/Thinking and Emotion showed smaller net changes.
3. Stroke subtype, hospitalisation duration, economic status and anticoagulant use were independently associated with HRQoL trajectories and may help identify patients at risk of suboptimal recovery.

Early longitudinal HRQoL assessment can complement conventional stroke outcomes by capturing patient-centred recovery across multiple domains.

IMPLICATIONS

Routine stroke-specific HRQoL assessment during early follow-up may help identify patients with slower or suboptimal recovery.

Domain-specific assessment may be particularly informative, because recovery was heterogeneous across physical, functional, cognitive, emotional and social domains.

Patients with longer hospitalisation, or other characteristics associated with lower HRQoL trajectories, may warrant closer rehabilitation and follow-up.

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