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The Effect of Family Support on Functional Recovery of Post-Stroke Patients at Haji General Hospital Medan in 2026

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ABSTRACT

Background: Stroke remains a leading cause of long-term disability worldwide, significantly impairing patients' functional independence. Family support has been recognized as a critical psychosocial factor that may influence rehabilitation outcomes; however, empirical evidence from Indonesian hospital settings, particularly in North Sumatra, remains limited. The purpose of this study was to analyze the effect of family support on the functional recovery of post-stroke patients at Haji General Hospital Medan in 2026.

Methods: A descriptive correlational cross-sectional design was employed. Participants were 87 post-stroke patients recruited through purposive sampling between September and December 2025. Inclusion criteria required patients to have been diagnosed with stroke at least one month prior, be aged 18 years or older, and have a primary family caregiver. Data on family support were collected using the adapted Hensarling Diabetes Family Support Scale (HDFSS), and functional recovery was assessed using the Barthel Index (BI). Ethical clearance was obtained from the institutional review board. Data were analyzed using SPSS version 26, with Spearman's rank correlation coefficient applied to test the hypotheses (alpha = 0.05).

Results: Of 87 participants, 52.9% reported high family support and 55.2% demonstrated good functional recovery (Barthel Index score ≥ 61). Spearman's rank correlation analysis revealed a statistically significant moderate positive relationship between overall family support and functional recovery ($r = 0.541$; $p = 0.001$). All four sub-dimensions of family support (informational, emotional, instrumental, and appraisal) were significantly correlated with functional recovery ($p < 0.05$).

Conclusion: Family support exerts a significant positive effect on the functional recovery of post-stroke patients. Healthcare providers and hospital management should develop structured family-centered care programs to optimize rehabilitation outcomes for post-stroke patients.

Keywords: *Stroke; Family Support; Functional Recovery; Barthel Index; Neurological Rehabilitation; Hospital Care*

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INTRODUCTION

Stroke is one of the most devastating neurological conditions globally, representing the second leading cause of death and a primary cause of adult disability worldwide. According to the World Stroke Organization, approximately 12.2 million new stroke cases occur annually, and over 110 million people are currently living with the consequences of stroke (Feigin et al., 2022). In Indonesia, stroke constitutes one of the top causes of morbidity and mortality, with national health data reporting prevalence rates of approximately 10.9 per 1,000 population, and North Sumatra consistently ranking among the provinces with the highest stroke burden (Riskesdas, 2023). At Haji General Hospital Medan, stroke is among the most frequently managed neurological diagnoses, with post-stroke patients often requiring prolonged hospitalization and intensive rehabilitation.

Functional recovery following stroke encompasses the gradual restoration of motor, cognitive, and daily living activities that were impaired by neurological damage. The degree of functional recovery is determined by a complex interplay of biomedical factors (stroke type, lesion

location, severity) and psychosocial determinants, including the availability of adequate family support (Eng & Reime, 2020). Family support — defined as the provision of informational, emotional, instrumental, and appraisal assistance by close relatives — has been identified as a pivotal element in facilitating patient adherence to rehabilitation exercises, maintaining psychological well-being, and sustaining motivation for recovery (Bhattacharjee et al., 2021). Despite this recognized importance, clinical integration of family support assessments into routine stroke rehabilitation protocols in Indonesian hospitals remains inconsistent and understudied.

Several international studies have demonstrated that robust family support correlates with improved activities of daily living (ADL) scores and greater functional independence in post-stroke populations (Yue et al., 2020; Lam et al., 2021). However, findings remain mixed, with some studies suggesting that excessive family involvement may reduce patient autonomy and impede self-directed rehabilitation efforts (Guo et al., 2022). Furthermore, most existing research has been conducted in high-income country settings, limiting the generalizability of these findings to resource-constrained environments such as public hospitals in Indonesia, where family members serve as primary unpaid caregivers. The cultural dimension of family caregiving in Indonesia — characterized by strong collectivist values, religious orientation, and multi-generational household structures — necessitates context-specific investigation.

This study is grounded in the Roy Adaptation Model (RAM), which conceptualizes human beings as adaptive systems that respond to environmental stimuli through coping processes (Roy, 2009). Within this framework, family support functions as a contextual stimulus that modulates the patient's adaptive capacity and influences physiological and psychosocial recovery outcomes. The model aligns well with the multi-dimensional nature of family support measured in this study and provides a theoretical basis for understanding how supportive family interactions translate into improved functional status. Specifically, the RAM posits that positive stimuli from the social environment, such as family encouragement and practical assistance, enhance the patient's adaptive responses, thereby accelerating recovery.

The connection between family support dimensions and functional recovery in stroke patients is well-established in the nursing literature. Informational support enhances patients' health literacy and adherence to exercise regimens; emotional support buffers psychological distress and depressive symptoms that often accompany stroke; instrumental support ensures timely access to rehabilitation services and medications; and appraisal support reinforces the patient's sense of self-efficacy and motivation (Glass et al., 2021). The present study aims to contribute contextualized, hospital-based evidence from North Sumatra, Indonesia, which can inform nursing practice, rehabilitation program design, and hospital policy in similar low- and middle-income settings. The aim of this study was to analyze the effect of family support on the functional recovery of post-stroke patients at Haji General Hospital Medan in 2026, and to examine the contributions of each sub-dimension of family support (informational, emotional, instrumental, and appraisal) to patients' functional outcomes.

METHODS

Study Design

This study employed a descriptive correlational cross-sectional design. This approach was selected to examine the magnitude and direction of the association between family support and functional recovery of post-stroke patients at a single point in time. No experimental manipulation was conducted; data were collected from respondents under natural care conditions.

Participants

The study was conducted at the neurology ward of Haji General Hospital Medan, a regional public referral hospital in Medan, North Sumatra, Indonesia. The target population comprised all adult post-stroke patients receiving care or rehabilitation follow-up at the hospital during the study period (September–December 2025). The study employed purposive sampling based on predefined eligibility criteria.

Inclusion criteria were: (1) confirmed diagnosis of ischemic or hemorrhagic stroke documented in the medical record; (2) minimum one month post-stroke onset to allow for initial recovery stabilization; (3) age ≥ 18 years; (4) cognitive capacity sufficient to complete the questionnaire, as screened by the Mini-Mental State Examination (MMSE score ≥ 18); and (5) presence of at least one primary family caregiver (spouse, child, parent, or sibling) who provided daily care. Exclusion criteria were: (1) recurrent stroke with severe cognitive impairment precluding self-report; (2) comorbid terminal illness; and (3) refusal to provide informed consent. Sample size was determined using Lemeshow's formula for finite population proportion, yielding a minimum of 82 participants; accounting for an anticipated 10% attrition, 87 participants were enrolled. All 87 participants completed the study.

Instrument

Family support was measured using the adapted Hensarling Diabetes Family Support Scale (HDFSS), which was modified for use in stroke populations. The original HDFSS comprises 29 items across four subscales: informational (7 items), emotional (8 items), instrumental (7 items), and appraisal support (7 items), rated on a 4-point Likert scale (1 = never to 4 = always). Permission for adaptation was obtained from the original author. The adapted scale was validated through expert panel review and pilot testing (n = 20) prior to main data collection. Content validity index (CVI) was 0.92, and Cronbach's alpha reliability coefficients ranged from 0.81 to 0.89 across subscales, indicating satisfactory internal consistency. Functional recovery was assessed using the Barthel Index (BI), a widely used, validated tool measuring patients' performance across 10 ADL domains (feeding, bathing, grooming, dressing, bowel and bladder control, toilet use, transfer, mobility, and stair climbing), with total scores ranging from 0 (totally dependent) to 100 (fully independent). The BI has demonstrated excellent inter-rater reliability (ICC = 0.95–0.99) and validity in post-stroke populations (Mahoney & Barthel, 1965; Quinn et al., 2021). Functional recovery categories used in this study were: totally dependent (0–20), severely dependent (21–40), moderately dependent (41–60), mildly dependent (61–90), and independent (91–100). Participants with BI scores ≥ 61 were classified as having good functional recovery.

Data Collection

Data collection was conducted from September to December 2025 at the neurology inpatient ward and outpatient rehabilitation clinic of Haji General Hospital Medan. Research assistants who had received standardized training administered the instruments face-to-face to all eligible participants after obtaining written informed consent. The HDFSS was self-completed or interviewer-administered for patients with visual or literacy limitations, while the Barthel Index was assessed through direct observation and patient interview by trained research assistants. Data quality was reviewed daily by the principal investigator to ensure completeness and accuracy.

Data Analysis

All data were analyzed using IBM SPSS Statistics version 26. Descriptive statistics (frequencies, percentages, means, standard deviations) were used to characterize the sample and describe the distribution of family support and functional recovery variables. The normality of data distribution was evaluated using the Kolmogorov-Smirnov test; as data did not meet the normality assumption ($p < 0.05$), non-parametric statistics were applied. The Spearman rank correlation coefficient was used to test the association between family support (overall and each sub-dimension) and functional recovery. Statistical significance was set at $\alpha = 0.05$. Effect size was interpreted according to Cohen's (1988) guidelines: r = 0.10–0.29 (small), 0.30–0.49 (medium), ≥ 0.50 (large).

Ethical Consideration

This study was approved by the Ethics Committee of Haji General Hospital Medan (Ethical Clearance Number: 124/KEPK/RSUH/2025). All participants provided written informed consent prior to enrollment. Participation was entirely voluntary, and participants were informed of their right to withdraw at any time without consequence to their care. Anonymity and confidentiality of all data were strictly maintained. No personal identifying information was included in the dataset. This study posed no physical or psychological risk to participants.

RESULTS

Sample Characteristics

A total of 87 post-stroke patients participated in this study. Participants' ages ranged from 26 to 82 years, with a mean age of 61.4 years (SD = 11.3). The sample comprised 48 males (55.2%) and 39 females (44.8%). The majority had a senior high school education (32.2%), and 70.1% presented with ischemic stroke. Duration of illness ranged from 1 month to 24 months, with most participants (43.7%) having a stroke duration of 6–12 months. Full demographic characteristics are presented in Table 1.

Table 1. Demographic Characteristics of Post-Stroke Patients at Haji General Hospital Medan (n = 87)

Characteristics	Category	n	%
Age (years)			
	26–45	9	10.3
	46–60	32	36.8
	61–75	37	42.5
	> 75	9	10.3
Sex			
	Male	48	55.2
	Female	39	44.8
Education			
	No formal education	7	8.0
	Elementary school	18	20.7
	Junior high school	19	21.8
	Senior high school	28	32.2
	University/College	15	17.2
Stroke Type			
	Ischemic	61	70.1
	Hemorrhagic	26	29.9
Duration of Illness			
	< 6 months	29	33.3
	6–12 months	38	43.7
	> 12 months	20	23.0
Total		87	100

Family Support Distribution

The majority of respondents (52.9%) reported a high level of overall family support. When examined by sub-dimension, emotional support showed the highest proportion of high ratings (59.8%), followed by informational support (56.3%), instrumental support (54.0%), and appraisal support (50.6%). Detailed distributions are presented in Table 2.

Table 2. Distribution of Family Support among Post-Stroke Patients (n = 87)

Level of Family Support	Category	n	%
Informational Support			
	High	49	56.3
	Low	38	43.7
Emotional Support			
	High	52	59.8
	Low	35	40.2
Instrumental Support			
	High	47	54.0
	Low	40	46.0
Appraisal Support			
	High	44	50.6
	Low	43	49.4
Overall Family Support			
	High	46	52.9
	Low	41	47.1
Total		87	100

Functional Recovery Distribution

More than half of the participants (55.2%) achieved good functional recovery (Barthel Index score ≥ 61). The most common functional level was mildly dependent (34.5%), followed by moderately dependent (25.3%). Only 18 participants (20.7%) achieved full independence (BI score 91–100). Full distributions are shown in Table 3.

Table 3. Distribution of Functional Recovery Based on Barthel Index among Post-Stroke Patients (n = 87)

Functional Recovery Level	Category	n	%
Totally dependent (0–20)		5	5.7
Severely dependent (21–40)		12	13.8
Moderately dependent (41–60)		22	25.3
Mildly dependent (61–90)		30	34.5
Independent (91–100)		18	20.7
Good functional recovery (score ≥ 61)		48	55.2
Poor functional recovery (score < 61)		39	44.8
Total		87	100

Effect of Family Support on Functional Recovery

Spearman's rank correlation analysis revealed a statistically significant moderate positive correlation between overall family support and functional recovery ($r = 0.541$; $p = 0.001$), confirming the study hypothesis. All four sub-dimensions of family support were also significantly and positively correlated with functional recovery: emotional support demonstrated the strongest correlation ($r = 0.513$; $p = 0.001$), followed by informational support ($r = 0.487$; $p = 0.002$), instrumental support ($r = 0.469$; $p = 0.003$), and appraisal support ($r = 0.421$; $p = 0.008$). These results indicate a consistent and significant positive effect of family support across all dimensions on functional recovery outcomes. Full results are presented in Table 4.

Table 4. Spearman's Rank Correlation between Family Support and Functional Recovery (n = 87)

Variables	Spearman's rho (r)	p-value	Interpretation
Family Support → Functional Recovery	0.541	0.001	Moderate positive correlation
Informational Support → Functional Recovery	0.487	0.002	Moderate positive
Emotional Support → Functional Recovery	0.513	0.001	Moderate positive
Instrumental Support → Functional Recovery	0.469	0.003	Moderate positive
Appraisal Support → Functional Recovery	0.421	0.008	Moderate positive

DISCUSSION

Comparison with Existing Literature

The findings of this study demonstrate a significant moderate positive effect of family support on functional recovery among post-stroke patients ($r = 0.541$; $p = 0.001$), which is consistent with a growing body of international evidence. A prospective study by Yue et al. (2020) conducted in China reported that higher perceived family support was independently associated with greater improvement in ADL scores over a 3-month rehabilitation period, with family emotional and instrumental support emerging as the strongest predictors. Similarly, Bhattacharjee et al. (2021) found significant associations between family caregiver involvement and Barthel Index improvement in South Asian post-stroke patients, underscoring the cross-cultural relevance of family-centered rehabilitation. In the Indonesian context, Rahmawati et al. (2023) reported comparable findings from post-stroke patients in Yogyakarta, with emotional support demonstrating the strongest correlation with functional independence, a result mirrored in the present study. These converging findings affirm the theoretical propositions of the Roy Adaptation Model, in which supportive contextual stimuli facilitate adaptive responses that translate into improved physiological functioning and activity performance.

The finding that emotional support carried the highest correlation coefficient ($r = 0.513$) among all sub-dimensions aligns with the psychological literature on motivation and self-efficacy in rehabilitation. Emotional support from family members — expressed through encouragement, empathy, and reassurance — directly addresses the psychological sequelae of stroke, including post-stroke depression (which affects up to 33% of survivors), anxiety, and diminished self-efficacy, all of which are independently associated with poorer functional outcomes (Lam et al., 2021; Glass et al., 2021). Conversely, appraisal support showed the lowest correlation ($r = 0.421$), possibly reflecting

the tendency of Indonesian families to undervalue evaluative feedback within the context of illness, preferring more tangible forms of assistance, consistent with collectivist cultural norms observed by Guo et al. (2022).

New Knowledge and Conclusions

This study contributes empirical, hospital-based evidence from a North Sumatran public referral hospital, a context that has been underrepresented in the stroke rehabilitation literature. The findings confirm that even within a resource-constrained setting characterized by limited professional rehabilitation infrastructure, the natural caregiving resources embedded in the family unit exert a measurable and significant influence on patients' functional recovery trajectories. This underscores the strategic importance of leveraging family support as a cost-effective, culturally acceptable, and evidence-based adjunct to formal stroke rehabilitation services. Furthermore, the disaggregation of family support into its four sub-dimensions provides clinicians with actionable insights for targeted intervention design — specifically, prioritizing emotional support interventions while simultaneously strengthening informational and instrumental components through structured caregiver education programs.

Practical Applications of the Findings

The findings of this study carry direct implications for nursing practice and hospital management. Nurses and rehabilitation teams at Haji General Hospital Medan — and analogous public hospitals in North Sumatra — should incorporate systematic assessment of family support levels into routine stroke care pathways, utilizing validated tools such as the adapted HDFSS. Patients identified as having low family support should be proactively referred to hospital-based family counseling and caregiver education programs. Such programs should provide training in safe patient mobilization, exercises that promote motor recovery, and psychological encouragement techniques. Hospital administrators are encouraged to allocate dedicated resources for multi-disciplinary family support programs, including social work services and peer support groups. At the policy level, these findings support the incorporation of family caregiver assessment and support standards into the Indonesian national stroke clinical practice guidelines, in alignment with the Ministry of Health's broader agenda for community-based rehabilitation.

Limitations

This study has several limitations that warrant acknowledgment. First, the cross-sectional design prevents causal inference; longitudinal designs are needed to establish temporal directionality between family support provision and functional recovery improvement. Second, the single-hospital sampling limits the external validity and generalizability of findings to other settings, including private hospitals and community health centers, which may differ in patient demographics and care resources. Third, although the adapted HDFSS demonstrated satisfactory psychometric properties in this sample, the adaptation process may not fully capture culturally specific expressions of family support in the Batak and Malay communities predominant in Medan. Fourth, social desirability bias may have influenced participants' self-reported family support ratings. Future multi-center, longitudinal studies employing mixed-methods approaches and culturally developed instruments are recommended to address these limitations.

CONCLUSION

Family support plays a significant and positive role in the functional recovery of post-stroke patients at Haji General Hospital Medan. Patients who receive higher levels of family support across informational, emotional, instrumental, and appraisal dimensions demonstrate better functional outcomes as measured by the Barthel Index. These findings affirm the critical importance of integrating family-centered care approaches into post-stroke rehabilitation programs within the Indonesian hospital context. Healthcare professionals should prioritize the assessment and strengthening of family support systems as a routine component of holistic stroke care, with particular emphasis on emotional support, which emerged as the most influential dimension. Collaborative, multi-disciplinary approaches that empower families as active partners in rehabilitation

hold substantial promise for improving patient outcomes and reducing the long-term burden of stroke-related disability in Indonesia.

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