

Rehabilitation-Based Education on Posture and Self-Management After a Stroke for Patients and Caregivers at Siloam Hospital Lippo Village

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ABSTRACT

Stroke is leading causes of disability, resulting in decreased Activities of Daily Living (ADL) independence and increased caregiver burden. Posture and self-management education is needed to support home rehabilitation. To evaluate the association between rehabilitation-based posture and self-management education with changes in knowledge, skills, ADL independence, and caregiver burden one week after the intervention. A one-group pre-test–post-test study was conducted on 13 post-stroke patient-caregiver dyads at the Medical Rehabilitation Installation of Siloam Hospital Lippo Village. The intervention consisted of 3 sessions of education delivered in 1 day, including lecture, demonstration, return demonstration, leaflet, video, and 4 weeks of WhatsApp follow-up. Outcomes were measured at baseline and 1 week after. Knowledge was assessed with a 20-item questionnaire. Skills were assessed with a return demonstration checklist. ADL independence was measured using the Barthel Index. Caregiver burden was measured using the Zarit Burden Interview. Data were analyzed using the Wilcoxon Signed-Rank Test. In 13 patients, mean knowledge score increased from 54.6 to 83.2, $p < 0.001$. In 13 caregivers, mean knowledge score increased from 51.3 to 85.7, $p < 0.001$. Skill competency was achieved by 10 of 13 patients [76.9%] and 12 of 13 caregivers [92.3%]. In patients, mean Barthel Index increased from 47.7 to 68.5, $p < 0.001$. The proportion of totally dependent patients decreased from 23.1% to 0%. In caregivers, mean ZBI score decreased from 29.8 to 20.1, $p = 0.001$. The proportion with heavy burden decreased from 53.8% to 23.1%. Rehabilitation-based posture and self-management education was associated with short-term improvements in knowledge, skills, ADL independence, and caregiver burden. The findings suggest feasibility, but further studies with a control group and longer follow-up are needed.

Keywords : ADL Independence, Barthel Index, Caregiver Burden, Education, Stroke.

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INTRODUCTION

Stroke is a leading cause of long-term disability worldwide. The World Health Organization reported 15 million people experience stroke annually, with 5 million resulting in permanent disability (WHO, 2023). In Indonesia, the national prevalence is 10.9 per 1,000 population, with the highest rates in urban areas (Ministry of Health RI, 2018). South

Tangerang is one of the areas with increasing stroke cases due to lifestyle changes and risk factors such as hypertension and diabetes mellitus.

Optimal recovery after stroke requires continuous rehabilitation both in hospital and at home. However, 70% of rehabilitation success depends on exercise performed outside formal therapy sessions (Kwakkel et al, 2017). In clinical practice at Siloam Hospital Village, patients receive therapy only 2-3 times per week for 30-45 minutes. The remaining time is spent at home without supervision. A study in the Jabodetabek area found that 68% of caregivers lacked knowledge of correct posture and transfer techniques, leading to Improper home exercises and increased risk of complications (Setiawan & Lestari, 2022).

Improper posture after stroke can inhibit neuroplasticity and delay motor recovery, while also increasing caregiver burden (Umphred et al, 2020). The main problem is low knowledge and skills of patients and caregivers regarding self-management at home. Educational interventions with direct demonstration have been shown to increase caregiver knowledge by 42% and reduce complications (Priyanti et al., 2021).

Although rehabilitation is essential, most post-stroke patients experience a significant gap between hospital-based therapy and home care. Limited therapy time in hospital settings often leads to discontinuity of exercise, which hinders motor recovery and functional independence. In addition, caregivers play a central role in assisting patients with daily activities, yet they frequently report high levels of stress and low confidence due to insufficient training (Kisner & Colby, 2019). This condition contributes to increased caregiver burden and suboptimal patient outcomes.

Educational interventions that combine verbal instruction, demonstration, and take-home media have been recognized as effective strategies to improve health literacy and self-management in chronic conditions. Previous studies show that structured education can enhance caregiver skills in positioning, transfer, and home exercise, which subsequently improve patient independence and support such as WhatsApp groups and demonstration videos also facilitate continuous learning and motivation at home (Widodo et al., 2023).

Given these gaps, this study aimed to evaluate the association between rehabilitation-based posture and self-management education and changes in knowledge, skills, ADL independence in patients, and caregiver burden among post-stroke patient-caregiver dyads at Siloam Hospital Lippo Village. Based on internal data of the Medical Rehabilitation Installation of Siloam Hospital Lippo Village in 2025, approximately 40-50 post-stroke patients receive outpatient therapy per month, with an average of 2-3 therapy sessions per week.

METHOD

This study used a one-group pre-test–post-test design. The educational program was conducted on July 4, 2026, at the Ballroom of Siloam Hospital Lippo Village. Outcome measurements were performed at two time points: at baseline prior to the intervention and one week after the intervention.

The participants were post-stroke patient-caregiver dyads recruited from the Medical Rehabilitation Installation of Siloam Hospital Lippo Village using consecutive sampling. The inclusion criteria for patients were: age ≥ 18 years, diagnosis of first or recurrent stroke for more than one month, in the sub-acute to chronic phase, had a Mini-Mental State Examination score ≥ 24 or were able to follow simple commands, and were undergoing outpatient rehabilitation 2-3 times per week. The exclusion criteria were severe aphasia and unstable medical conditions. Each patient was accompanied by one primary caregiver who was involved in daily care.

The intervention consisted of rehabilitation-based posture and self-management education delivered in three sessions within a total duration of four hours by two

physiotherapists and one nurse. Session one focused on posture in bed and sitting for 45 minutes. Session two covered transfer techniques and Activities of Daily Living training for 45 minutes. Session three addressed the home exercise program for 45 minutes. Educational media included printed leaflets, a five-minute instructional video, and a WhatsApp group for follow-up over four weeks. Reminders to perform home exercises were sent three times per week through the WhatsApp group.

Patient and caregiver knowledge was measured using a 20-item questionnaire developed by the researchers. Content validity was established by two experts. The total score ranged from 0 to 100 and was categorized as Good ≥ 80 , Fair 60–79, and Poor < 60 . Skills were assessed using a return demonstration checklist that included three basic positions and five home exercises. A score of $\geq 80\%$ was considered competent. Patient ADL independence was measured using the Indonesian validated version of the Barthel Index with a score range of 0–100. The categories were: total dependent 0–20, severe dependent 21–60, moderate dependent 61–90, mildly independent 91–99, and independent 100. Caregiver burden was measured using the 22-item Indonesian version of the Zarit Burden Interview with a score range of 0–88. The categories were: light burden 0–20, moderate burden 21–40, and heavy burden 41–88. Exercise adherence and participant satisfaction were assessed through self-report via the WhatsApp group and a satisfaction questionnaire at one week follow-up.

Data were analyzed using SPSS version 26. Normality of data distribution was tested using the Shapiro-Wilk test. Because the data were not normally distributed, the Wilcoxon Signed-Rank Test was used to compare pre-test and post-test scores. The level of significance was set at $p < 0.05$. Effect size r was also calculated to determine the magnitude of the effect.

This study was approved by the Ethics Committee of Strada Indonesia University with approval number dated. Written informed consent was obtained from all patients and caregivers prior to participation. Participant confidentiality and anonymity were maintained throughout the study by using coded identifiers for data analysis and reporting. [00521/STRADA/5/2.2.8/VI/2026] [02/07/2026].

RESULTS

This community service activity was attended by 26 participants consisting of 13 post-stroke patients and 13 primary caregivers at the Ballroom of Siloam Hospital Lippo Village. The program was conducted on time according to the schedule and consisted of three education sessions followed by discussion. Evaluation was carried out through pre-test, post-test, skill observation, and 1 week follow-up.

The primary outcome of this activity was a significant increase in knowledge and skills of both patients and caregivers after the education. In 13 patients, mean knowledge score increased from 54.6 to 83.2, $p < 0.001$. In 13 caregivers, mean knowledge score increased from 51.3 to 85.7, $p < 0.001$. Qualitatively, 88.5% of all 26 participants were in the “Good” knowledge category after the intervention.

In terms of psychomotor skills, skill competency was achieved by 10 of 13 patients [76.9%] and 12 of 13 caregivers [92.3%]. Three patients [23.1%] still required physical assistance, mainly for bed-to-wheelchair transfer.

In patients, mean Barthel Index increased significantly from 47.7 to 68.5, $p < 0.001$. Before the intervention, 3 patients [23.1%] were totally dependent. After 1 week, no patient was totally dependent and 5 patients [38.5%] became mildly independent.

Table.1 Results of the ADL Independence Test for Patients

Barthel Index Category	Pre-Education		1week Post-Education	
	n	%	n	%
Total Dependent	3	23.1	0	0.0
Severe Dependent	5	38.5	2	15.4
Moderate Dependent	5	38.5	6	46.2
Mildly Independent	0	0.0	5	38.5
Total	13	100.0	13	100.0
Mean Score	47.7		68.5	
p-value	0.000*			

In caregivers, mean ZBI score decreased significantly from 29.8 to 20.1, $p = 0.001$. The proportion of caregivers with heavy burden dropped from 7 of 13 [53.8%] to 3 of 13 [23.1%], while those with light burden increased from 1 of 13 [7.7%] to 5 of 13 [38.5%].

Table.2 Caregiver Burden Before and After Education

ZBI Category	Pre-Education		1 week Post-Education	
	n	%	n	%
Heavy Burden	7	53.8	3	23.1
Moderate Burden	5	38.5	5	38.5
Light Burden	1	7.7	5	38.5
Total	13	100.0	13	100.0
Mean Score	29.8		20.1	
p-value	0.001*			

During 4 weeks follow-up, 10 of 13 patients [76.9%] reported performing home exercises ≥ 3 times per week. Eleven of 13 caregivers [84.6%] reported implementing 2-hourly position changes and ergonomic principles. Participant satisfaction was very high, with 25 of 26 participants [96.2%] rating the program as “Very Satisfied”.

Table.3 Compliance, Posture Application, and Participant Satisfaction Follow-Up

Variable	Result	
	n	%
Patient compliance with home exercise		
- Performing exercises >3 times per week	10	76.9
- Performing exercises <3 times per week	3	23.1
Caregiver Application of Posture Principles		
- Implementing 2-hourly position changes and ergonomic principles	11	84.6
- Not implementing consistently	2	15.4
Participant Satisfaction		
- Very satisfied	25	96.2
- Satisfied	1	3.8
Total Participants	26	100.0

DISCUSSION

The main finding of this study was that rehabilitation-based posture and self-management education was associated with short-term improvements in knowledge, skills, ADL independence, and caregiver burden among 13 post-stroke patient-caregiver dyads one week after the intervention. Knowledge scores increased significantly in both patients and caregivers. Skill competency was achieved by 76.9% of patients and 92.3% of caregivers.

Barthel Index scores increased and the proportion of totally dependent patients decreased to 0%. Caregiver burden as measured by ZBI also decreased, with a reduction in the proportion of caregivers experiencing heavy burden.

The improvements observed may be explained by several factors. First, the combination of lecture, demonstration, return demonstration, and take-home media such as leaflets and videos is consistent with adult learning principles that emphasize cognitive information reinforced by psychomotor practice and repeated exposure (Notoatmodjo, 2018). This approach likely increased health literacy and self-efficacy for both patients and caregivers in performing correct posture and home exercises. Second, the use of a WhatsApp group for 4 weeks with thrice-weekly reminders may have supported behavior maintenance and reduced uncertainty in home management. However, because this study used a one-group pre-post design without a control group, the observed changes cannot be attributed solely to the education. Improvements in ADL and caregiver burden may also have been influenced by ongoing outpatient rehabilitation 2-3 times per week, natural recovery in the sub-acute to chronic phase, baseline disease severity, motivation, and other unmeasured factors.

The increase in mean Barthel Index from 47.7 to 68.5 within one week represents a 20.8-point change. This magnitude is clinically notable but should be interpreted with caution given the short follow-up period. Previous rehabilitation studies report that clinically important change for the Barthel Index in stroke ranges from 9.25 to 12 points (Hsieh et al., 2007). The larger change in this study may reflect the combined effect of hospital therapy and the initiation of structured home practice, rather than education alone. It is also plausible that patients with moderate baseline dependence have greater potential for early gains compared to those with severe impairment. In terms of caregiver burden, the mean ZBI reduction from 29.8 to 20.1 is consistent with findings from Priyanti et al. (2021), who reported that caregiver training with demonstration reduced burden by improving skills and confidence. A possible mechanism is that education increased caregiver mastery of safe transfer and positioning techniques, which reduced physical strain, anxiety about causing injury, and time spent on care tasks. As caregiver competence increased, perceived burden decreased.

These findings suggest that a brief, structured education program delivered prior to discharge is feasible and acceptable in a hospital rehabilitation setting. With 96.2% of participants reporting “Very Satisfied” and 76.9% reporting exercise adherence ≥ 3 times per week, the model shows potential to bridge the gap between supervised therapy and home care. Integrating posture and self-management education with digital follow-up into routine discharge planning may help sustain home exercise and support caregivers. However, implementation should consider the need for simplified materials for varying education levels and alternatives for limited home space and equipment.

This study has several limitations. First, the one-group pre-post design without a control group limits causal inference and does not account for the effects of concurrent rehabilitation or spontaneous recovery. Second, the small sample size of 13 dyads from a single center limits statistical power and generalizability. Third, participants were heterogeneous in stroke type, duration, and severity, which may affect response to the intervention. Fourth, adherence to home exercise and posture application was self-reported and subject to recall and social desirability bias. Fifth, the follow-up period was only 1 week, thus long-term maintenance of knowledge, skills, and functional gains remains unknown. Future studies should use a randomized controlled design with a larger sample, longer follow-up of 3 to 6 months, and objective measures of adherence to confirm these preliminary findings.

CONCLUSION

In conclusion, in this one-group pre-test–post-test study of 13 post-stroke patient-caregiver dyads, rehabilitation-based posture and self-management education was associated with short-term improvements in knowledge, skills, ADL independence, and caregiver burden at one week follow-up. The program demonstrated feasibility and high participant satisfaction. Given the small sample size, single-center design, and absence of a control group, causal effectiveness cannot be established. Further evaluation with a larger sample, a control or comparison group, and longer follow-up is warranted before considering broader implementation in routine clinical practice.

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