



RESEARCH ARTICLE

Article URL: <https://ojs.poltekkes-malang.ac.id/index.php/HAJ/index>**A Case Study: Nursing Care in Stroke Patients with Impaired Skin Integrity**Agus Wiwit Suwanto^{1(CA)}, Endang Purwaningsih², Heru Wiratmoko³, Marcella Linda Indriani⁴^{1,2,3,4} Department of Nursing Poltekkes Kemenkes MalangCorrespondence author's email (CA): aguswiwitsuwanto@poltekkes-malang.ac.id

ABSTRACT

Stroke is a leading cause of long-term disability and often results in impaired skin integrity due to immobilization. This study aimed to analyze nursing care for stroke patients with impaired skin integrity at Dr. Harjono Hospital, Ponorogo. The research was conducted from April to May 2025 using a case study design with a descriptive qualitative approach involving a 66-year-old patient diagnosed with ischemic stroke and at high risk of pressure ulcers based on the Braden Scale. Data were collected through interviews, observations, physical examinations, and Braden Scale assessments. Nursing interventions included pressure ulcer management, regular skin monitoring, adequate nutritional support, and repositioning every two hours to prevent further tissue damage. After seven days of nursing care, the patient's Braden Scale score improved from 11 (high risk) to 16 (low risk), indicating enhanced skin condition and reduced risk of ulceration. Evaluation showed that impaired skin integrity problems were resolved through consistent and comprehensive nursing interventions. The study concludes that a holistic nursing approach—emphasizing prevention, nutrition, and family involvement—plays a crucial role in maintaining skin integrity and improving the quality of care for stroke patients.

Keywords: Stroke; Skin; Nursing; Care

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INTRODUCTION

Stroke is one of the leading causes of mortality and long-term disability worldwide. According to the World Health Organization (WHO), stroke ranks as the second leading cause of death globally, accounting for more than 11% of total deaths each year, with over six million fatalities annually⁽¹⁾. Beyond its mortality impact, stroke often results in chronic disability, including impaired mobility and dependence in daily activities, which significantly reduces quality of life. Studies show that surviving stroke frequently leads to long-term functional deficits and dependency, increasing the burden on patients and caregivers⁽¹⁾.

The burden of stroke is predicted to increase in low- and middle-income countries in line with population aging, urbanization, and increasing prevalence of risk factors. The GBD 2021 study projects rising numbers of incident strokes, deaths, and DALYs in LMICs; the majority of the global stroke mortality and disability now resides in these countries(2), (3), (4).

In Indonesia, stroke has been identified as a major public health problem. Data from the 2018 Riset Kesehatan Dasar (Riskesdas) reported a national prevalence of 10.9 per 1,000 population, with higher rates in several provinces such as North Sulawesi and Maluku. Stroke is also associated with high levels of dependency, where approximately 13.9% of patients are totally dependent in daily life. In East Java, stroke prevalence reached 1.24 per 1,000 population in 2018, marking a significant regional burden(4). This indicates the urgency of strengthening preventive and rehabilitative efforts, particularly through effective nursing care.

Stroke is also associated with high levels of dependency, where a substantial proportion of patients are totally dependent in daily life. For example, analyses of the 2018 Riskesdas data show that among elderly stroke survivors, there is a high prevalence of severe disability and dependency in activities of daily living (5).

At the clinical level, stroke patients often experience prolonged immobilization, which predisposes them to complications such as impaired skin integrity and pressure ulcers. Pressure ulcers remain a global issue in both developed and developing countries, as they increase hospital length of stay, healthcare costs, and risk of infection. Systematic reviews/meta-analyses show that immobilized hospital patients (including stroke patients) have significantly higher incidence of pressure ulcers and that outcomes worsen with longer immobilization(5).

Previous studies highlight that early and comprehensive nursing interventions, including the use of standardized tools such as the Braden Scale, effective wound care, adequate nutrition, and mobilization strategies, can reduce the incidence and severity of skin integrity impairment among immobilized patients. For instance, a meta-analysis in stroke patients showed that evidence-based nursing interventions greatly reduced pressure ulcer incidence (from ~22.8% to ~5.2%) and improved quality of life(6).

This study aims to analyze nursing care for stroke patients with impaired skin integrity through a case study approach conducted at RSUD Dr. Harjono, Ponorogo. The findings are expected to contribute to improving nursing practice in preventing complications and enhancing the quality of care for stroke patients.

METHODS

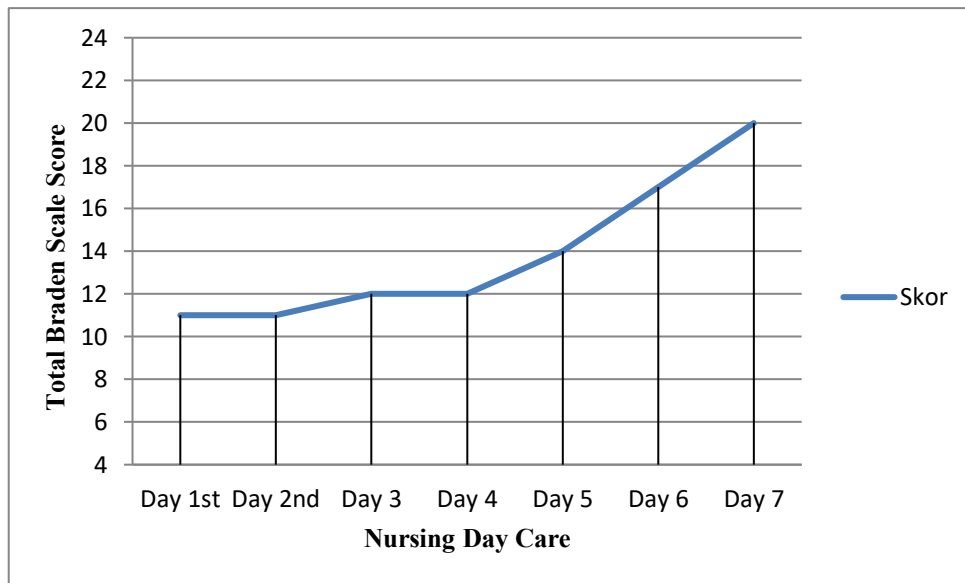
This research employed a qualitative descriptive approach with a case study design. The study was conducted at Dr. Harjono Regional Hospital, Ponorogo under the ethical clearance number 0054213502121112025041600016/IV/KEPK/2025, involving one patient aged 66 years who met the

inclusion criteria: diagnosed with ischemic or hemorrhagic stroke by a physician, experiencing high risk decubitus ulcers according to the Braden Scale, hospitalized in the inpatient ward of Dr. Harjono Hospital, Ponorogo during the study period, and willing to participate by signing an informed consent form. The exclusion criteria included stroke patients with chronic skin diseases such as psoriasis, severe dermatitis, or diabetic ulcers that could interfere with the assessment of skin integrity, as well as those who were transferred to another hospital or discharged before the completion of nursing care. Data were collected through interviews, observation, and physical examination, supported by the use of the Braden Scale instrument to assess the risk of pressure ulcers. Nursing interventions were planned and implemented based on the patient's nursing diagnoses, particularly impaired skin integrity related to immobility. The interventions were guided by the *Standar Intervensi Keperawatan Indonesia (SIKI)*(7) and adapted to the patient's condition including regular repositioning, wound care, nutritional support, and Swedish massage to prevent further complications and promote skin integrity. The validity of the research findings was ensured through triangulation of data sources and techniques, namely by comparing the results of interviews, observations, and medical record documentation. Data analysis was carried out descriptively by reducing, categorizing, and interpreting the data to obtain a comprehensive picture of the nursing care process. The entire process of data collection and analysis was carried out ethically, with informed consent obtained from the patient's family and approval from the hospital, thus maintaining research integrity and patient confidentiality.

RESULT

The research subject was one patient, Mr. S, a 66-year-old male diagnosed with recurrent stroke. The patient had a history of hypertension and first experienced a stroke in 2022, with recurrence in April 2025. At admission, the patient presented with left-sided weakness, limited mobility, and dependence on family for activities of daily living. Physical examination showed muscle strength on the right extremities was 5, while on the left hand was 3 and the left leg was 2. The Braden Scale assessment on the first day indicated a score of 11, categorized as high risk for pressure ulcers.

The risk of pressure ulcers was evaluated daily using the Braden Scale, which includes six parameters: sensory perception, moisture, activity, mobility, nutrition, and friction/shear. The distribution of scores during the seven days of care is presented in figure 1.



Figur 1. Braden Scale Score Progression (Day 1-7)

There was a progressive increase in Braden Scale scores from day 1 to day 7, indicating improvement in skin integrity and reduction in risk level. On day 1, the score was 11, categorized as high risk, while by day 7, the score had increased to 20, which is categorized as low risk. The most significant improvement was observed in the moisture and sensory perception parameters, showing that the patient's skin condition became less moist and the ability to respond to stimuli improved. Activity level showed the slowest progress, as the patient still required assistance for mobilization.

Overall, the findings demonstrate that comprehensive nursing care, including regular repositioning, wound care, nutritional support, and Swedish massage, effectively improved the patient's skin integrity and reduced the risk of pressure ulcers from high to low within seven days of treatment.

DISCUSSION

This study demonstrated a progressive improvement in the Braden score from *high risk* (score 11) to *low risk* (score 20) on the seventh day. This finding indicates that consistent nursing interventions were effective in improving skin integrity and reducing the risk of pressure injuries in stroke patients with impaired skin integrity.

The most significant improvements were observed in the *sensory perception* and *moisture* dimensions, suggesting that the patient's ability to perceive pressure or irritation improved alongside better moisture control of the skin. Enhanced sensory perception allows patients to respond earlier to signs of irritation, facilitating prompt preventive interventions. This finding is consistent with previous research showing that systematic nursing interventions significantly reduced the incidence of pressure injuries in neurological patients compared with conventional

care ($p < 0.05$)(8). Furthermore, improvement in the moisture dimension not only preserves the integrity of the epidermis but also reduces the risk of skin maceration that facilitates the penetration of microorganisms(9).

The *activity* dimension showed the slowest progress, with low scores maintained throughout most observation days and only modest improvement on the final day. This outcome is expected, given that stroke patients typically experience motor weakness and dependency on assisted mobilization. Hence, consistent mobilization strategies and family education are essential in supporting improvements in physical activity.

Daily nursing interventions—including vital sign monitoring, skin assessment, wound care, scheduled repositioning, and mobilization education every two hours—constituted a multifaceted bundle of care. Recent evidence highlights that multifaceted interventions, combining repositioning, education, and regular monitoring, are highly effective in reducing the prevalence of pressure injuries(10) These daily interventions not only strengthen the foundational layer of prevention but also enhance the engagement of the nursing team in evaluating and adapting prevention strategies according to the patient's current condition. This supports the effectiveness of multifaceted interventions in reducing practice variability and ensuring consistency in the implementation of pressure injury prevention measures. A recent systematic study demonstrated that multifaceted interventions—including care bundles, education, and repositioning strategies—successfully reduced the prevalence of pressure injuries from 60.9% to 28.7% ($p < 0.05$)(11).

Specifically, repositioning every two hours remains the standard strategy for preventing pressure injuries. While studies in elderly populations in long-term care facilities suggest that repositioning every 3–4 hours may be equally effective under certain conditions, a two-hour interval is still recommended for high-risk populations such as stroke patients(12). A quasi-experimental study conducted among stroke patients comparing repositioning every 1 hour versus every 2 hours demonstrated no significant difference in the incidence of pressure injuries between the two groups ($p > 0.05$). However, patients who were repositioned more frequently reported fewer early signs of skin redness and irritation. Furthermore, a recent meta-analysis found that repositioning at intervals of 2–3 hours was associated with a reduced risk of pressure injuries compared with longer intervals (4–6 hours), with an odds ratio of 0.75 (95% CI: 0.61–0.90; $p = 0.03$)(13).

A meta-analysis in stroke patients confirmed that evidence-based nursing interventions significantly reduced pressure injury incidence from 22.84% to 5.22% (OR = 0.18, 95% CI:

0.13–0.24, $p < 0.001$) and improved patients' quality of life(6). This evidence reinforces the reliability of the nursing strategies applied in the present case.

Regarding the use of the Braden Scale as a risk assessment tool, literature supports its moderate predictive validity, with an AUC of 0.82, sensitivity of 0.78, and specificity of 0.72(13). However, heterogeneity across studies in terms of cut-off values and clinical populations necessitates contextual interpretation tailored to the patient's condition.

The Braden Scale has been widely adopted in nursing protocols, largely due to its high inter-rater reliability and extensive clinical use(14). In this study, daily Braden Scale monitoring enabled responsive evaluation of the patient's progress and guided the direction of care.

The observed improvement in Braden scores further suggests that intensive nursing, combined with family education and regular monitoring, can lead to clinically meaningful outcomes within a relatively short period. These findings are consistent with targeted Braden-guided nursing interventions in surgical patients, which have demonstrated reductions in wound size and shorter healing durations compared to standard care(15).

Additional factors influencing pressure injury risk—such as nutritional status, skin moisture, shear, and comorbid conditions—must also be considered. Recent studies indicate that shear and friction are significantly associated with the development of pressure injuries, with an adjusted odds ratio of approximately 5.71 in hospitalized patients(16). In the present case, the *friction/shear* dimension also showed improvement, contributing to safer outcomes.

Barriers to effective implementation of pressure injury prevention programs often include insufficient knowledge among nurses, lack of adherence to protocols, and high clinical workload(17). Therefore, the consistency achieved in implementing interventions in this study can be regarded as a critical determinant of its positive outcomes. For example, a multi-center study in Ghana found that while most nurses ($\approx 79\%$) had good knowledge about pressure injury prevention, nearly all reported poor attitudes, with insufficient time/work overload and inadequate equipment/logistics among the top barriers. This indicates that without addressing workload and resource challenges, even well-trained staff struggle to implement preventive interventions in practice(18). Furthermore, a cross-sectional study among critically ill nurses in Rwanda revealed that heavy workload, inadequate staffing, shortages of equipment, and competing priorities significantly impeded the application of pressure injury prevention practices despite acceptable knowledge levels. This supports the idea that consistent adherence to preventive protocols requires organizational support, adequate staffing, and resource availability(19). Another study focusing on ICU nurses in China showed that participation in

training significantly predicted better adherence to pressure injury prevention clinical guideline; conversely, when protocols or guidelines exist but are not supported by training or leadership, adherence drops, particularly under high workload demands(20).

Moreover, recent evidence highlights that nurses' knowledge of pressure injury prevention and use of the Braden Scale improves care quality, reduces length of stay, and lowers the incidence of pressure injuries(21). These findings underscore the importance of continuous education, not only for nurses but also for family caregivers, to enhance the effectiveness of nursing interventions. For instance, a self-learning package intervention for nurses using the Braden Scale among critically ill patients significantly improved their knowledge, practice, and attitudes, which was associated with better patient outcomes and reduced pressure ulcer rates. Another study assessing intensive care nurses in Indonesia found that poor knowledge is associated with longer hospital stays and worse patient outcomes, and that specific training and higher educational level were strong predictors of better prevention of pressure injuries(22).

Although this study focused on a single case, the findings provide preliminary evidence that structured and consistent nursing interventions can lead to significant clinical improvement in a short time frame. Nonetheless, the scalability and reproducibility of these interventions need further evaluation in larger populations.

Several limitations should be acknowledged. The single-case design precluded inferential statistical analysis, and individual variability in response to interventions may be considerable. Furthermore, external factors such as dietary nutrition, comorbidities, and family compliance with mobilization instructions could have influenced the outcomes.

In conclusion, the progressive improvement in Braden scores observed in this case demonstrates that intensive, multimodal, and educational nursing interventions can effectively enhance skin integrity in stroke patients within a short period. Future studies should employ quantitative designs, such as randomized controlled trials or cohort studies, in larger stroke populations. Additionally, the role of moderating factors—such as nutritional status and family compliance—should be investigated to statistically validate the effectiveness of these interventions.

CONCLUSION

This study demonstrated that intensive, multimodal, and educational nursing interventions significantly improved Braden scores in a high-risk stroke patient. The consistent increase from *high risk* to *low risk* within seven days highlights the effectiveness of a structured approach combining repositioning, daily monitoring, wound care, and patient–family education. Future research should adopt

quantitative designs with larger samples and investigate moderating factors such as nutritional status and family compliance to statistically validate the intervention's effectiveness.

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