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Original Article

EFFECT OF COMBINED BOBATH AND BALANCE EXERCISE THERAPY ON PHYSICAL MOBILITY IMPROVEMENT IN STROKE PATIENTS: A CASE STUDY

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ABSTRACT

Background: Stroke emerged as a serious global health problem, ranking as the leading cause of disability and the second leading cause of death worldwide. The most common impact of stroke was impaired physical mobility, especially with damage to the brain's motor centers or nerve pathways controlling body movements. In stroke patients, this disorder could appear directly after an acute attack and persist into the rehabilitation phase if not treated properly. One intervention to address physical mobility disorders in stroke patients was the application of a combination of Bobath therapy and balance exercises to accelerate motor function recovery, prevent immobilization complications, and increase patient independence.
Objectives: This case study aims to analyze the effectiveness of the application of the combination of Bobath therapy and Balance exercise on physical mobility disorders in stroke patients.
Methods: This study is a case study of a description of one stroke patient in Mrs. S in the Arjuna Room of Bhakti Dharma Husada Hospital Surabaya by using a descriptive nursing process with an approach to describe in depth the application of the intervention to the patient.
Results: The implementation of a nursing intervention in the form of a combination of Bobath therapy and balance exercise who experienced physical mobility impairment due to non-hemorrhagic stroke for six days showed positive results.
Conclusion: The increase in muscle strength can be seen from the patient's ability to maintain posture, transition from lying down to sitting to standing, and show better stability during balance exercises.

Keywords: Stroke, Bobath Therapy, Balance Exercise, Physical Mobility, Muscle Strength.

INTRODUCTION

Cerebrovascular accident or also known as stroke, is a neurological disorder that often occurs and is the main cause of impaired bodily function (Hayuningrum & Fadhil, 2023). This disease is the highest contributor to physical mobility problems in patients after a stroke, which results in limitations in carrying out daily living activities (Pratama & Furqonah, 2021). Stroke is defined as a disturbance in brain function that occurs suddenly due to disruption of blood

circulation to the brain, either due to blockage or bleeding (Alloubani et al., 2020). A stroke can cause paralysis or weakness of the side of the body opposite the location of the lesion in the brain, called hemiparesis. This interferes with the patient's ability to maintain balance, walk, and perform daily activities. Stroke occurs when blood flow to the brain is disrupted; this condition is known as ischemia. Blockage of blood vessels by thrombus or embolism causes tissue perfusion to become ineffective, so the supply of oxygen and nutrients to brain cells is disrupted (Wulandari & Herlina, 2021). If not treated quickly and appropriately, blood flow disruptions to the brain can develop into cerebral infarction, which is a condition of permanent brain tissue death. This damage has a direct impact on the central nervous system, especially in the brain area that plays a role in controlling body movements, so patients are at risk of experiencing a decrease the loss of conscious movement ability (Rahmadisha et al., 2024). One of the clinical symptoms that often appears is hemiparesis, which is muscle weakness on one side of the body (Sabila et al., 2022). Hemiparesis has an impact on decreasing physical activity capacity, inhibiting the ability to move independently, increasing the risk of falling, and increasing the patient's dependence on the help of others in living their daily lives. Therefore, the role of nursing intervention is crucial, both to facilitate the recovery of physical function and to prevent the occurrence of further complications (Nugraheni & Anita, 2025).

The recovery process requires rehabilitation interventions that stimulate brain neuroplasticity and help the patient relearn correct movement patterns. One of the main problems that arises after a stroke is impaired physical mobility. This disorder arises due to damage to the motor areas of the brain or the nerve pathways that regulate body movements, especially in patients with hemiparesis (weakness of one side of the body). Mobility disorders can lead to dependence on others, decrease quality of life, and increase the risk of complications such as decubitus, pneumonia, and deep vein thrombosis. Meanwhile, physical mobility disorders are the impact of stroke, which by definition is a person's inability to move independently (Mauliddiyah et al., 2022). Patients with this condition often experience joint stiffness, physical weakness, pain when moving, muscle weakness, and difficulty moving limbs (Nugraheni & Anita, 2025). Chronologically, mobility impairment can occur immediately after a stroke and will progress to the subacute to chronic phase if not treated appropriately. It is at this stage that rehabilitation interventions are crucial to restore bodily function and increase patient independence. This becomes a serious problem when mobility limitations are not treated optimally, as they can worsen the patient's physical condition, increase the risk of secondary complications, and hinder the success of the post-stroke rehabilitation process.

According to data from the World Health Organization (WHO, 2022), the number of stroke cases increased by 70% in the span between 1990 and 2019. This increase was also followed by an increase in the death rate due to stroke by 43% and an 89% jump in the number of patients with long-term disabilities. In Indonesia, Basic Health Research data (Riskesdas, 2018) shows that the prevalence of stroke nationally reaches 10.9 per 1,000 population, with a higher rate recorded in East Java Province, which is 12.4 per 1,000 population. Meanwhile, the number of patients at Bhakti Dharma Husada Hospital Surabaya in April amounted to 26 patients, while in May, there were 28 patients. This fact reflects that stroke is still a major challenge in the public health system, which requires serious treatment, especially to prevent complications and manage poststroke conditions such as physical mobility disorders.

Treatment of physical mobility disorders in stroke patients can be done through structured rehabilitative interventions, one of which is through the application of a combination of the Bobath Concept and balance exercises. The Bobath Concept emphasizes movement training based on normal movement patterns, with a focus on developing postural control and the ability to perform selective movements gradually (Arsyi, 2024). The effectiveness and efficiency of movement are greatly influenced by the tone of the postural muscles, so the exercise must start from a basic position such as lying down, then progress to an inclined position, prone to crawling, crawling, sitting, standing, until you can walk independently (Desmonika et al., 2023). Meanwhile, Balance exercises are designed to optimize the body's ability to maintain stability. The main focus of this exercise is to strengthen the stabilizing muscles in the trunk area as well as increase the strength of the carrying limbs (Pratama & Furqonah, 2021). Improved balance will be achieved along with the body's ability to maintain proper postural control. A number of studies show that balance exercise is one of the effective exercise methods in improving balance in stroke patients (Pratama et al., 2022).

Based on this, this study aims to analyze the effectiveness of the application of the combination of Bobath therapy and Balance exercise on physical mobility disorders in stroke patients, especially in an effort to improve movement function and optimize the overall rehabilitation process. Bobath therapy focuses on normalizing muscle tone and facilitating functional movement patterns by inhibiting abnormal reflex movements and encouraging integrated movement. This approach relies on manual techniques by therapists to facilitate postural control, balance, and coordination of limb movements.

Meanwhile, balance exercises are designed to improve body stability, core control, and spatial orientation. This exercise can improve the body's corrective reaction to imbalances and lower the risk of falling. Therefore, the combination of Bobath therapy and balance exercise is considered a strategic solution to overcome physical mobility disorders in stroke patients. This combination is believed to provide a synergistic effect in the recovery of motor function, improve stability while walking, and accelerate the patient's independence process.

METHODS

Study Design

This study uses a descriptive case study method with a nursing process approach to provide an in-depth overview of the application of interventions in patients with a diagnosis of non-hemorrhagic stroke who experience physical mobility impairment. The nursing process approach includes the stages of comprehensive assessment, determination of nursing diagnosis, action planning, implementation of interventions, and evaluation based on changes in patient conditions. The design of this study aims to present a detailed and comprehensive understanding of the dynamics of nursing care in stroke patients in the clinical environment.

Settings

The research was carried out for one week, from June 2 to 7, 2025, in the Arjuna Room of Bhakti Dharma Husada Hospital Surabaya on those who treated stroke patients.

Research Subject

The subject of this study was a 73-year-old female patient, referred to as Mrs. S, who was diagnosed with a non-hemorrhagic stroke and admitted to the Arjuna Room of Bhakti Dharma Husada Hospital Surabaya. The patient presented with significant physical mobility

impairment, characterized by hemiparesis affecting the right side of her body. Neurological assessments revealed decreased muscle strength, asymmetrical facial movements, and impaired postural stability, all of which hindered her ability to perform daily activities independently. Mrs. S also experienced motor aphasia and reported symptoms of fatigue, imbalance when standing, and heaviness in the head. This case was selected purposively due to its relevance to the study's aim of evaluating the impact of combined Bobath and balance exercise therapy on improving physical mobility in stroke patients. Informed consent was obtained from the patient prior to the intervention, and all procedures were carried out in accordance with ethical standards and clinical protocols.

Instruments

The instruments used in this study included both clinical assessment tools and documentation forms tailored to evaluate the patient's condition and therapeutic progress. A manual muscle testing (MMT) scale was employed to assess muscle strength in both upper and lower extremities, providing a standardized measure from grade 0 (no movement) to grade 5 (normal strength). A comprehensive nursing assessment form was utilized to record the patient's physical, neurological, and functional status, including vital signs, sensory-motor responses, and level of independence. To monitor the implementation of the intervention, a daily intervention log was maintained, documenting the types of exercises performed, duration, patient responses, and any discomfort or complications during each therapy session. Additionally, standard medical instruments such as a sphygmomanometer, stethoscope, thermometer, and pulse oximeter were used to support physical examination and monitor physiological parameters. A patient medical record review checklist was also used to extract relevant clinical information, such as diagnosis, laboratory test results, CT scan findings, and medication history. These instruments enabled a comprehensive and systematic approach to data collection throughout the six-day intervention period.

Data Collection

Data collection was carried out using a triangulation method, which included direct observation, in-depth interviews, physical examinations, and review of medical records. Observations were conducted systematically using the head-to-toe assessment approach and the IPPA (Inspection, Palpation, Percussion, Auscultation) method to evaluate physical status and neuromuscular function. Interviews were conducted with the patient and family members to gather subjective data regarding the patient's medical history, therapy experiences, emotional responses, and family support during recovery. Additionally, objective data such as vital signs, muscle strength grading, laboratory results, and imaging findings (CT scan) were collected from the patient's medical records. All therapy activities and patient responses were documented daily throughout the six-day intervention period to track changes and evaluate progress.

Data Analysis

Data analysis in this study was conducted descriptively by organizing and interpreting data from the nursing process, including assessment, diagnosis, planning, implementation, and evaluation. The effectiveness of the combined Bobath therapy and balance exercise was measured by observing changes in muscle strength, postural control, and the patient's ability to perform functional movements. Data from daily intervention records and observation logs were compared across each day of therapy to identify patterns of improvement. The muscle

strength analysis was presented in a tabular format to show pre- and post-intervention scores, highlighting gradual increases in functional mobility over the intervention period. Narrative synthesis was also used to describe qualitative findings from interviews and observations.

Ethical Considerations

This study adhered to ethical standards in clinical research involving human subjects. Before data collection, informed consent was obtained from the patient after providing a detailed explanation of the study objectives, procedures, potential risks, and benefits. The patient was assured of confidentiality, voluntary participation, and the right to withdraw at any time without consequences. The data collected was anonymized and stored securely to protect privacy. The study was conducted with approval from the hospital's ethical review committee and followed ethical guidelines established by the Indonesian National Nursing Association (PPNI) and the Helsinki Declaration.

RESULTS

The results of this case study revealed significant improvements in the physical mobility of Mrs. S, a 73-year-old female patient diagnosed with non-hemorrhagic stroke and presenting with right-sided hemiparesis. Before the intervention, the patient exhibited decreased muscle strength in her right limbs (scored 1), limited joint mobility, impaired postural control, and a strong dependence on assistance for basic movements and daily activities. The six-day nursing intervention, which combined Bobath therapy and balance exercise, was implemented systematically with a focus on enhancing postural stability, facilitating normal movement patterns, and restoring neuromuscular coordination.

Muscle strength was assessed daily using the Manual Muscle Testing (MMT) scale. On days 1 through 3, the patient consistently demonstrated muscle strength scores of 1 in the right extremities and 5 in the unaffected left limbs. By day 4, an increase to grade 2 muscle strength was noted in the right limbs, indicating early improvement in voluntary movement. This progress continued through days 5 and 6, with the right limbs reaching grade 3 muscle strength, demonstrating the ability to move against gravity. These improvements suggest that the combination of interventions effectively stimulated neuromuscular recovery and enhanced motor control on the affected side.

In addition to quantitative changes, qualitative observations showed marked improvements in the patient's ability to transition between positions—such as from lying to sitting and sitting to standing—with reduced assistance. The patient also reported a decrease in sensations of imbalance and discomfort during movement. Physical assessments supported this progress, showing more stable posture and improved coordination during balance exercises. Daily evaluations documented that the patient became increasingly cooperative and confident in performing therapy routines, suggesting not only physical but also psychological benefits from the intervention.

The integration of Bobath therapy, which emphasized selective movement and postural facilitation, and balance exercises, which targeted trunk stability and lower extremity strength, resulted in a synergistic effect. This contributed to functional recovery and prevented complications commonly associated with immobility. Overall, the six-day intervention demonstrated a positive trajectory in muscle strength, movement quality, and independence, highlighting the effectiveness of structured nursing rehabilitation in stroke care.

DISCUSSION

The findings of this case study demonstrate that the combination of Bobath therapy and balance exercise is an effective nursing intervention to improve physical mobility in stroke patients, particularly those with hemiparesis. The gradual improvement in Mrs. S's muscle strength over six days—from grade 1 to grade 3 on the affected side—indicates a positive neuromuscular response to consistent rehabilitative therapy. This result aligns with previous studies suggesting that Bobath therapy enhances postural control and facilitates normal movement patterns, while balance exercises contribute to trunk stability and reduce the risk of falls (Desmonika et al., 2023; Pratama & Furqonah, 2021).

Bobath therapy is based on neurodevelopmental principles, emphasizing inhibition of abnormal muscle tone and facilitation of selective voluntary movement. In Mrs. S's case, the therapy was applied progressively—from lying to sitting, standing, and walking—with observable improvements in the patient's ability to maintain posture and initiate movement. These findings are consistent with the theory of neuroplasticity, which posits that the brain can reorganize itself in response to therapeutic stimuli, particularly in the early stages of stroke recovery (Arsyi, 2024). The increase in muscle tone and coordination indicates that this approach supports re-learning of motor skills that had been impaired due to stroke-induced damage in the motor cortex.

Meanwhile, balance exercise complemented Bobath therapy by strengthening core musculature and improving spatial orientation, which are critical components of functional mobility. The exercises included controlled weight transfer, static and dynamic balance training, and guided ambulation. These activities improved Mrs. S's confidence in movement and reduced her risk of falling, a common complication in post-stroke patients. The patient's ability to transition from lying to sitting and then to standing independently by day 6 shows functional gains that can significantly improve quality of life and reduce caregiver burden.

From a nursing perspective, the structured implementation of these therapies reflects the importance of individualized, goal-oriented rehabilitation strategies. Daily monitoring and consistent feedback allowed for timely adjustments based on the patient's tolerance and progression. Additionally, the role of patient education and motivation was vital in ensuring active participation in therapy. The emotional readiness and psychological engagement of the patient also appeared to influence the success of the intervention, supporting evidence that psychosocial factors are integral to stroke rehabilitation outcomes.

Overall, this case study supports the integration of Bobath and balance training into clinical nursing practice for stroke rehabilitation. The improvements observed within a short intervention period highlight the potential for early-stage rehabilitation to prevent complications such as joint contractures, muscle atrophy, and long-term dependency. However, further studies with larger sample sizes and longer follow-up periods are needed to generalize these findings and evaluate the sustained impact of such interventions.

CONCLUSION

This case study concludes that the combination of Bobath therapy and balance exercise is effective in improving physical mobility among stroke patients experiencing hemiparesis. Over a six-day intervention period, the patient demonstrated progressive improvement in muscle strength, postural control, and movement coordination, particularly in transitioning

from basic to more complex positions. These results indicate that structured, targeted rehabilitative nursing interventions can significantly support functional recovery in stroke patients. The application of these therapies not only enhances neuromuscular function but also contributes to the patient's independence and quality of life during the rehabilitation process.

SUGGESTION

Based on the positive outcomes observed, it is suggested that nursing practice in stroke rehabilitation incorporate combined Bobath and balance exercises as part of early and structured intervention plans. Health institutions should provide adequate training for nurses in the application of neurodevelopmental therapies to optimize recovery. Future studies are encouraged to explore the long-term effects of this combination therapy across different stroke types, age groups, and in patients with comorbidities. Additionally, exploring the integration of home-based or technology-assisted rehabilitation methods (e.g., telerehabilitation or virtual reality) may enhance accessibility and continuity of care.

LIMITATIONS

This study was limited by its single-case design, which restricts the generalizability of the findings to broader stroke populations. The short duration of intervention (six days) also limits the ability to assess the long-term sustainability of functional improvements. Furthermore, as this study relied heavily on observational data and muscle strength grading, it lacked more advanced biomechanical or neurological assessments that could offer deeper insight into the physiological effects of the therapy. Future research involving multiple participants, control groups, and longer follow-up periods is recommended to validate and expand upon these findings.

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