

**Review**

**Rehabilitation With Bridging Exercise In Stroke Patients: Systematic Review**

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**ABSTRACT**

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**Keywords:**


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**Background:** Stroke is a neurological disease that can result in weakness in part or all of the body, emphasizing the importance of early mobilization in post-stroke recovery. One of the fundamental physical exercises recommended is the bridging exercise. This article evaluates the impact of bridging exercises on stroke patients through a systematic review approach, focusing on their potential to improve rehabilitation outcomes.


**Methods:** The methodology involved a systematic review of studies from 2020 to 2024, using journal databases such as Google Scholar, Science Direct, and PubMed. Keywords like "Bridging exercise," "Stroke," "Stroke patients," "Rehabilitation," "Muscle strength," and "Body balance" guided the search. Articles included in the review were in English and selected based on PRISMA guidelines, resulting in seven eligible studies for analysis.

**Results:** The results of this review highlight that bridging exercises significantly improve muscle strength and body balance among stroke patients. The exercises demonstrated a positive influence on patients' rehabilitation progress, contributing to better physical and functional health outcomes.


**Conclusion:** In conclusion, bridging exercises serve as an effective intervention in stroke rehabilitation, promoting early mobilization and improving post-stroke recovery. Encouraging stroke patients to incorporate these exercises into their rehabilitation routines could enhance overall health and functional capabilities.

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
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**Introduction**

Stroke is. The most common cause of disability or dependence on physical activity is because it results in loss of motor control function. In general, problems that often occur post-stroke involve sensorimotor disorders, cognitive decline, and psychiatric disorders. One common disorder is sensorimotor

dysfunction, which affects sensory and motor components, disrupting the body's posture control system. This impairment can prevent the body from maintaining balance in specific positions. ([Hasbiah, Suciani P, Akhmad, & Tang, 2023](#); [Ismoyowati, 2019](#)). Rehabilitation must be done to reduce dependence on post-stroke



physical activity by controlling the trunk ([Pandya & Sutaria, 2021](#)).

Stabilization of the spine and pelvis is essential in maintaining body stability when in a functional position and increasing muscle strength and balance during movement. Trunk stabilization exercises include pelvic tilt, quadruped, abdominal hollowing, and bridging exercises ([Dulay & Tanjung, 2020](#)). One therapy that can be carried out is bridging exercise because it can increase muscle strength in the lower back. Hips, which can improve balance in stroke patients if done correctly because the patient fully raises the hips with knee flexion of 90°, can show better balance control for a minimum of 30 seconds 3-6 times a week for 1 month ([Ismoyowati, Winandari, Layuk, Handayani, & Angwarmase, 2022](#)).

Initiating rehabilitation during the acute phase is crucial to prevent complications, promote recovery, and enhance functional independence. Therefore, it should be started as early as possible ([Anjos et al., 2023](#)). The recovery process from a stroke takes quite a long time, so it is essential to practice exercise every day and consistently. Post-stroke physical activity improves mobility and stability, blood circulation, and heart health ([Margot, Hoessly, & Hedges, 2017](#)). According to the findings from previous studies conducted by ([Suryani, 2023](#)), The results indicated that bridging exercises positively impacted body balance in patients with non-hemorrhagic stroke. Study ([Ismoyowati, 2019](#)) The results showed that after bridging exercise (BE) was carried out for 1 week with 1 day 8 repetitions, there were better changes in muscle strength after the intervention in stroke patients. This article aims to assess the effect of bridging exercises on muscle

strength in stroke patients through a systematic review.

## Methods

### Study Design

This research article employs a systematic review design, utilizing the standard systematic review and Meta-Analysis approach (PRISMA) to conduct the review.

### Eligibility Criteria

The criteria for this article are based on the PICO framework (Population, Intervention, Comparison, Outcome) to establish the eligibility criteria for inclusion and exclusion in the review of randomized studies. The following are the specific criteria:

P (Population): Stroke patients

I (Intervention): Bridging Exercise

C (Comparison): Does not use a comparator

O (Outcome): Muscle strength

### Search Strategy

The databases utilized for this systematic review include Google Scholar, Science Direct, and PubMed. A systematic search for articles was conducted from 2020 to 2024 using a variety of keywords: "Bridging exercise," "Stroke," "Stroke patient," "Rehabilitation," "Muscle strength," and "Body balance." Only articles published in English were considered.

### Study Selection and Synthesis

The feasibility of the articles was assessed by reviewing full-text articles. Only those deemed relevant were included in this literature review. The process and results of the article selection are illustrated in the PRISMA diagram (Figure 1). Based on the search across journal databases, the following results were obtained: Google Scholar (17,900 articles), PubMed (73

articles), and Science Direct (896 articles). After applying the inclusion and exclusion criteria, 7 articles were selected for review.

## Results

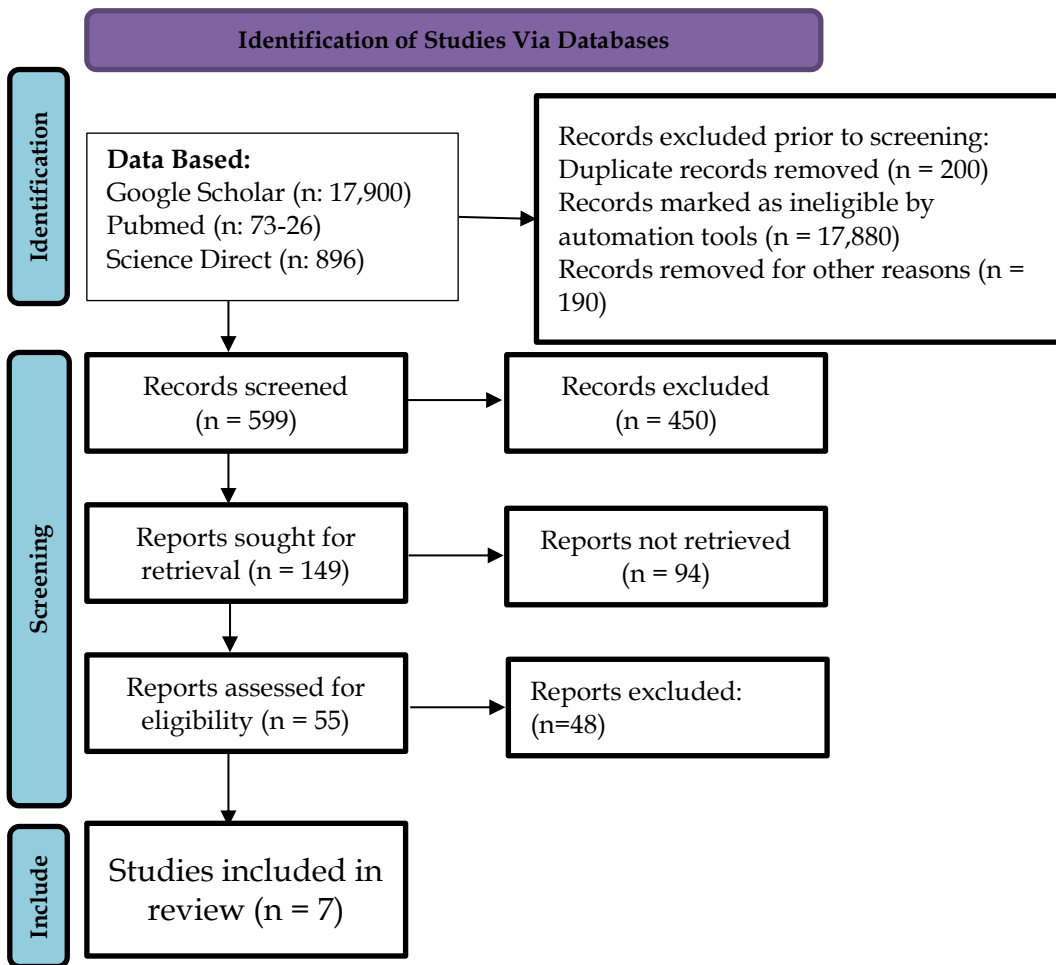


Figure 1. FlowChard PRISMA

**RESULTS**

**Tabel 1. Characteristic of study**

No.	Journal	Method	Results
1.	The Intermediate of Single Leg Bridge Exercise on Abdominal Muscle Activity in Subacute Stroke Patients: A Preliminary Study ( <a href="#">Kim et al., 2021</a> ).	<b>Design:</b> Cross-sectional study <b>Sample:</b> 15 subacute stroke patients <b>Variables:</b> Single-leg Bridge exercises and Abdominal muscles <b>Instrument:</b> Electromyography system <b>Analysis:</b> -	The results indicated that the single-leg bridge exercise effectively enhanced abdominal muscle strength in stroke patients.
2.	Effect of Various Types of Bridge Exercise on Walking Ability of Stroke Patients ( <a href="#">Ynag &amp; Uhm, 2020</a> ).	<b>Design:</b> Experiment <b>Sample:</b> 30 stroke patients who experienced hemiparalysis <b>Variables:</b> Bridge exercise and balance walking <b>Instrument:</b> 1. Gait analysis equipment 2. 10m walking test 3. The Figure 8 walking test <b>Analysis:</b> Anova	The study results demonstrated that bridge exercises effectively enhanced walking balance in stroke patients.
3.	The Effect of Bridging Exercise and Heel Rises Exercises on Balance Post Stroke in Makassar City ( <a href="#">Hasbiah et al., 2023</a> ).	<b>Design:</b> Quasi experimental <b>Sample:</b> <b>Variables:</b> Bridging exercises, heel rise exercises and body balance <b>Instruments:-</b> <b>Analysis:</b>	Based on the research results show that there is the effectiveness of bridging exercise on changes in body balance with p-value (0.001) < (0.05).

No.	Journal	Method	Results
		Wilcoxon	
4.	The Effect of Bridging Exercises on Muscle Strength and Body Balance in Stroke Patients at the National Brain Center Hospital Prof. Dr. Mahar Mardjono, East Jakarta ( <a href="#">Desvita, Sofiani, &amp; Yunitri, 2024</a> ).	<b>Design:</b> Experiment <b>Sample:</b> 19 people <b>Variables:</b> Bridging exercises, muscle strength and body balance. <b>Instrument:</b> <b>Analysis:</b> Paired sample t-test	There is an effect of riding exercises on muscle strength and body balance with a p-value (0.001) < (0.05).
5.	The Effect of Bridging Exercise to Improve Balance in Post Stroke Patients at Kartini Hospital Jepara ( <a href="#">Intani, 2022</a> ).	<b>Design:</b> Experimental with a single case report <b>Sample:</b> 1 person <b>Variables:</b> Bridging exercise and balance <b>Instrument:</b> Berg balance score	Comparing before and after bridging exercises, the results demonstrate that this intervention effectively improves balance in post-stroke patients.
6.	The Effect of Bridging Exercise and Gait Intervention on Hemiparesis After Ischemic Stroke at Prof. Dr. Margono Soekarjo Hospital, Purwokerto: A Case Report ( <a href="#">Pradani, Faris Naufal, &amp; Wijayaningsih, 2021</a> ).	<b>Design:</b> A case report <b>Sample:</b> 1 person <b>Variables:</b> Bridging exercise, gait intervention, and hemiparesis <b>Instrument:</b> Berg balance score	After the intervention was carried out every 2 weeks for 1 month, the results showed the effectiveness of bridging exercise and gait intervention on changes in body balance and muscle strength.
7.	Comparative Effects of Single-Leg Stance, Bridging, and Core Stability Exercise on Balance in Older Adults ( <a href="#">Salsabila, Rahman, &amp; Lindoyo, 2023</a> ).	<b>Design:</b> Quasi experiment <b>Sample:</b> 30 people <b>Variables:</b> Single-leg Stance Exercise and Bridging Exercise <b>Instrument:</b> Berg balance score <b>Analysis:</b> Independent t-test	The research showed no significant difference between giving single-leg stance exercises and bridging exercises.

## Discussion

Post-stroke, patients often experience a decline in walking speed, which is linked to reduced lower extremity strength. Sensorimotor dysfunction leads to balance impairments, including muscle weakness, decreased soft tissue flexibility, and disrupted motor and sensory control. As a result, post-stroke patients may lose coordination, affecting their body balance and posture.

Restoring the ability to walk, even for short distances, requires repeated and continuous practice, so people spend more than 15 minutes daily on mobility training. One of the exercises post-stroke patients can do to restore muscle strength is bridging exercises. Bridging exercise can reduce muscle spasticity by strengthening exercises on the paraspinal, quadricep, hamstring and gluteal muscles. ([Ramba & Hendrik, 2019](#)).

Research from ([Kim et al., 2021](#)) The results indicate that the single-leg bridge exercise is effective in enhancing abdominal muscle strength in stroke patients ( $p$ -value  $< 0.05$ ). This finding is supported by research ([Ynag & Uhm, 2020](#)) showing that bridge exercise effectively improved walking balance in stroke patients.

Research from ([Hasbiah et al., 2023](#)) The results demonstrate the effectiveness of bridging exercises in improving body balance, with a  $p$ -value of 0.00, less than 0.05. This finding is supported by research from ([Desvita et al., 2024](#)). The results show that there is an effect of bridging exercise on muscle strength and body balance with a  $p$ -value ( $0.00 < 0.05$ ).

Research from ([Intani, 2022](#)) Shows that bridging exercise effectively improves balance in stroke patients. Research from ([Pradani et al., 2021](#)) The results show

that bridging exercise and gait intervention are effective on changes in body balance and muscle strength after the intervention is carried out every 2 weeks for 1 month. Research from ([Salsabila et al., 2023](#)) showed an effect of giving single leg stance exercise and bridging exercise, but there was no significant difference between the two. Based on several studies above, this aligns with research ([Ramba & Hendrik, 2019](#)) that bridging exercise influences the spasticity of non-hemorrhagic post-stroke patients in Makassar.

## Conclusion

In conclusion, the systematic review of 7 articles demonstrates that bridging exercises have a beneficial impact on muscle strength, body balance, and various aspects of neuromotor function in stroke patients. These exercises can be an effective component of the rehabilitation process to support recovery. Future research should explore the long-term effects of bridging exercises on stroke rehabilitation, investigate optimal intensity and frequency for different patient populations, and evaluate how these exercises can be integrated with other therapeutic interventions to enhance overall recovery outcomes.

## Authors Contributions

All authors collaborated and helped each other write this article.

## Conflicts of Interest

No conflict of interest

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11

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