

## A Comparative Study of Functional Outcomes Following Early Versus Delayed Mobilization in Patients Undergoing Total Hip Arthroplasty

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### ABSTRACT

**Background:** Total hip arthroplasty (THA) is an effective surgical procedure for relieving pain and restoring mobility in patients with advanced hip disorders. Postoperative mobilization plays a crucial role in functional recovery, reducing complications, and improving patient independence. This study aimed to compare functional outcomes following early versus delayed mobilization in patients undergoing THA. **Materials and Methods:** This prospective comparative observational study included 50 patients undergoing primary THA, divided into early mobilization (n = 25) and delayed mobilization (n = 25) groups. Early mobilization was initiated within 24 hours, whereas delayed mobilization commenced after 48 hours postoperatively. Functional outcomes were assessed using the Harris Hip Score (HHS), Visual Analogue Scale (VAS), walking ability, length of hospital stay, and postoperative complications over six months. **Results:** Baseline characteristics were comparable between groups. Time to first ambulation was significantly shorter in the early mobilization group ( $18.4 \pm 3.6$  versus  $54.8 \pm 8.2$  hours;  $p < 0.001$ ). Hospital stay was also reduced ( $5.2 \pm 1.4$  versus  $7.8 \pm 2.1$  days;  $p < 0.001$ ). At six months, HHS was significantly higher in the early mobilization group ( $91.2 \pm 5.8$  versus  $85.4 \pm 7.1$ ;  $p = 0.003$ ). Postoperative pain scores were lower, and independent walking without assistance was achieved by 76% versus 52% of patients, respectively. **Conclusion:** Early mobilization following THA was associated with faster functional recovery, improved hip function, reduced postoperative pain, and shorter hospitalization. Supervised early rehabilitation may improve postoperative outcomes and promote functional independence.

**Keywords:** Total hip arthroplasty; Early mobilization; Delayed mobilization; Functional outcomes; Harris Hip Score; Postoperative rehabilitation.

### INTRODUCTION

Total hip arthroplasty (THA) is a widely performed orthopaedic procedure for managing advanced osteoarthritis, avascular necrosis of the femoral head, femoral neck fractures, and other debilitating hip disorders. The primary objectives of THA are to alleviate pain, restore joint mobility, improve functional independence, and enhance quality of life. However, successful postoperative recovery depends not only on implant stability and pain relief but also on the timely restoration of walking ability and independence in activities of daily living. Postoperative rehabilitation,

particularly the timing of mobilization, plays a crucial role in achieving these functional goals [1,2].

Early mobilization has emerged as an essential component of enhanced recovery after surgery (ERAS) protocols following THA. It generally involves initiating assisted sitting, standing, weight-bearing, and ambulation within the first 24 hours after surgery, depending on clinical stability. In contrast, delayed mobilization typically involves initiating ambulation after 24–48 hours or later. Early mobilization promotes venous circulation, maintains muscle strength, improves joint flexibility, and reduces complications associated with prolonged immobilization, including deep vein

thrombosis, pulmonary complications, and muscle deconditioning. It may also facilitate earlier functional recovery, shorten hospitalization, and improve patient satisfaction [3–7].

Adequate postoperative analgesia is fundamental to successful early mobilization. Pain, residual anaesthetic effects, orthostatic hypotension, and lower-limb muscle weakness may delay ambulation and restrict participation in physiotherapy. Contemporary rehabilitation protocols therefore emphasize multimodal analgesia, motor-sparing regional anaesthetic techniques, and supervised physiotherapy to facilitate safe mobilization. Nevertheless, individual patient characteristics, including age, comorbidities, preoperative functional status, and surgical factors, may influence the feasibility and effectiveness of early rehabilitation [7–10].

Functional outcomes following THA are commonly evaluated using standardized assessment tools such as the Harris Hip Score (HHS) and Oxford Hip Score, alongside parameters including pain intensity, hip range of motion, walking ability, time to independent ambulation, and length of hospital stay [11,12]. Although early mobilization is increasingly recommended, variations in rehabilitation protocols and patient characteristics have resulted in uncertainty regarding the magnitude of its advantages over delayed mobilization. Furthermore, limited comparative evidence from different clinical settings highlights the importance of evaluating the relationship between mobilization timing and postoperative functional recovery [13–15].

Therefore, the present study, entitled “A Comparative Study of Functional Outcomes Following Early Versus Delayed Mobilization in Patients Undergoing Total Hip Arthroplasty,” aims to compare functional recovery, postoperative pain, walking ability, duration of hospitalization, and complications between patients undergoing early and delayed mobilization. The findings may help optimize postoperative rehabilitation protocols and improve functional outcomes following THA.

## **MATERIALS AND METHODS**

### **Study Design and Setting**

The present study was designed as a prospective, hospital-based, comparative observational study to evaluate functional outcomes following early versus delayed mobilization in patients undergoing total hip arthroplasty (THA). The study was conducted in the Department of Orthopaedics at a tertiary care teaching hospital. Patients undergoing primary total hip arthroplasty who fulfilled the eligibility criteria were enrolled and followed up to assess postoperative functional recovery.

### **Study Duration**

The study was conducted over a period of 18 months, including patient recruitment, postoperative rehabilitation, follow-up assessments, data collection, and statistical analysis.

### **Sample Size**

A total of 50 patients undergoing primary total hip arthroplasty were included in the study. Patients were divided into two groups according to the timing of postoperative mobilization:

- Group A (Early Mobilization): 25 patients who initiated assisted mobilization within 24 hours following surgery.
- Group B (Delayed Mobilization): 25 patients who initiated assisted mobilization after 48 hours following surgery.

### **Sampling Technique**

Patients were recruited using a consecutive sampling technique based on the predefined inclusion and exclusion criteria. Eligible patients were categorized according to the timing of their first postoperative mobilization. Both groups were evaluated using standardized functional assessment parameters.

### **Inclusion Criteria**

1. Patients aged 18 years and above.
2. Patients undergoing primary unilateral total hip arthroplasty for osteoarthritis, avascular necrosis of the femoral head, or other indicated hip disorders.
3. Patients who were medically stable and eligible for postoperative rehabilitation.
4. Patients willing to participate and provide written informed consent.
5. Patients available for scheduled postoperative follow-up assessments.

### **Exclusion Criteria**

1. Patients undergoing revision or bilateral total hip arthroplasty.
2. Patients with pathological fractures secondary to malignancy.
3. Patients with severe neurological or neuromuscular disorders affecting mobility.
4. Patients with uncontrolled cardiovascular or respiratory conditions that contraindicated early ambulation.
5. Patients with postoperative complications requiring prolonged immobilization or intensive care.
6. Patients who were unwilling to participate or unable to complete follow-up assessments.

## Preoperative Assessment

All enrolled patients underwent a detailed preoperative evaluation, including demographic characteristics, medical history, clinical examination, and relevant radiological investigations. Baseline parameters such as age, sex, body mass index, affected side, indication for surgery, comorbidities, and preoperative functional status were recorded. Preoperative hip function was assessed using the Harris Hip Score (HHS). Routine laboratory investigations and anaesthetic fitness assessments were performed according to institutional protocols.

## Surgical Procedure

All patients underwent primary total hip arthroplasty using standard surgical techniques under appropriate anaesthesia. The surgical approach, prosthesis selection, and fixation technique were determined by the operating orthopaedic surgeon according to the patient's clinical condition and anatomical requirements. Perioperative antibiotic prophylaxis, thromboprophylaxis, postoperative analgesia, and wound care were provided according to institutional protocols. Relevant intraoperative parameters and postoperative complications were documented.

## Postoperative Mobilization Protocol

Group A: Early Mobilization (n = 25)

Patients in the early mobilization group initiated supervised mobilization within 24 hours after surgery, following confirmation of haemodynamic stability and adequate pain control. Mobilization included bedside sitting, standing with assistance, weight-bearing as permitted, and walking with a walker or other appropriate assistive device. Progressive physiotherapy exercises, including ankle pumps, quadriceps strengthening, hip range-of-motion exercises, and gait training, were performed under supervision.

Group B: Delayed Mobilization (n = 25)

Patients in the delayed mobilization group initiated assisted standing and ambulation after 48 hours postoperatively. During the initial postoperative period, patients received routine nursing care, pain management, and appropriate bed-based exercises. Subsequently, supervised physiotherapy, progressive weight-bearing, gait training, and strengthening exercises were initiated according to individual tolerance and clinical stability.

Both groups received standardized postoperative care and rehabilitation guidance, with progression of activities based on patient tolerance and surgical precautions.

## Outcome Assessment

Functional outcomes were evaluated using the following parameters:

1. Harris Hip Score (HHS): Hip function was assessed preoperatively and at 6 weeks, 3 months, and 6 months postoperatively. The HHS evaluated pain, functional ability, deformity, and range of motion, with higher scores indicating better hip function.

2. Postoperative Pain: Pain intensity was assessed using the Visual Analogue Scale (VAS), ranging from 0 (no pain) to 10 (worst imaginable pain), at predefined postoperative intervals.

3. Time to First Ambulation: The duration between completion of surgery and the first assisted ambulation was recorded in hours.

4. Functional Mobility: Walking ability, requirement for assistive devices, independence in daily activities, and progression to independent ambulation were assessed during follow-up.

5. Length of Hospital Stay: The duration of postoperative hospitalization was recorded in days.

6. Postoperative Complications: Complications such as deep vein thrombosis, surgical site infection, hip dislocation, falls, and other rehabilitation-related adverse events were documented.

## Follow-up Assessment

All patients were evaluated during the immediate postoperative period and subsequently at 6 weeks, 3 months, and 6 months after surgery. At each follow-up visit, functional recovery, pain intensity, walking ability, and complications were assessed. The Harris Hip Score was used to compare functional improvement between the early and delayed mobilization groups.

## Data Collection

Data were recorded using a structured case record form containing demographic details, clinical characteristics, operative findings, mobilization timing, functional assessment scores, and postoperative outcomes. Information obtained during hospitalization and follow-up visits was compiled for statistical analysis.

## Statistical Analysis

The collected data were entered into Microsoft Excel and analysed using SPSS 27 statistical software. Continuous variables were expressed as mean  $\pm$  standard deviation, while categorical variables were presented as frequencies and percentages. The normality of continuous data was assessed using the Shapiro–Wilk test. The independent samples t-test or Mann–Whitney U test was used to compare continuous variables between the two groups, depending on data distribution. The chi-square test or Fisher's exact test was used to compare categorical variables. Changes in functional scores over time were evaluated using SPSS 27 repeated-measures statistical methods. A p-value of less than 0.05 was considered statistically significant.

## RESULTS

A total of 50 patients undergoing total hip arthroplasty (THA) were included in the study and divided into two groups: Early Mobilization (n = 25) and Delayed Mobilization (n = 25). Both groups were compared regarding demographic characteristics, postoperative recovery, functional outcomes, pain scores, walking ability, and postoperative complications.

**Table 1. Comparison of Demographic and Baseline Clinical Characteristics Between the Two Groups (N = 50)**

| Parameter                               | Early Mobilization (n = 25) | Delayed Mobilization (n = 25) | p-value |
|-----------------------------------------|-----------------------------|-------------------------------|---------|
| Age (years), Mean $\pm$ SD              | 61.8 $\pm$ 9.4              | 63.2 $\pm$ 10.1               | 0.614   |
| Age group, n (%)                        |                             |                               |         |
| 40–50 years                             | 4 (16.0)                    | 3 (12.0)                      |         |
| 51–60 years                             | 8 (32.0)                    | 7 (28.0)                      |         |
| 61–70 years                             | 9 (36.0)                    | 10 (40.0)                     |         |
| >70 years                               | 4 (16.0)                    | 5 (20.0)                      |         |
| Sex, n (%)                              |                             |                               |         |
| Male                                    | 15 (60.0)                   | 14 (56.0)                     | 0.774   |
| Female                                  | 10 (40.0)                   | 11 (44.0)                     |         |
| BMI (kg/m <sup>2</sup> ), Mean $\pm$ SD | 25.2 $\pm$ 3.1              | 25.6 $\pm$ 3.4                | 0.666   |
| Affected side, n (%)                    |                             |                               |         |
| Right                                   | 14 (56.0)                   | 13 (52.0)                     | 0.777   |
| Left                                    | 11 (44.0)                   | 12 (48.0)                     |         |
| Indication for THA, n (%)               |                             |                               |         |
| Osteoarthritis                          | 12 (48.0)                   | 13 (52.0)                     |         |
| Avascular necrosis                      | 9 (36.0)                    | 8 (32.0)                      |         |
| Femoral neck fracture                   | 4 (16.0)                    | 4 (16.0)                      |         |
| Preoperative Harris Hip Score           | 42.6 $\pm$ 7.8              | 41.9 $\pm$ 8.2                | 0.759   |

As shown in Table 1, the mean age of patients in the early mobilization group was 61.8  $\pm$  9.4 years, compared with 63.2  $\pm$  10.1 years in the delayed mobilization group (p = 0.614). Most patients belonged to the 61–70-year age group in both groups (36.0% and 40.0%, respectively). Male patients constituted 60.0% and 56.0% of the respective groups. The mean BMI was comparable (25.2  $\pm$  3.1 versus 25.6  $\pm$  3.4 kg/m<sup>2</sup>; p = 0.666). Osteoarthritis was the most common indication for THA, followed by avascular necrosis and femoral neck fracture. The preoperative Harris Hip Score was also comparable between the groups (42.6  $\pm$  7.8 versus 41.9  $\pm$  8.2; p = 0.759), indicating similar baseline functional status.

**Table 2. Comparison of Postoperative Mobilization and Early Recovery Parameters Between the Two Groups (N = 50)**

| Parameter                                        | Early Mobilization (n = 25) | Delayed Mobilization (n = 25) | p-value |
|--------------------------------------------------|-----------------------------|-------------------------------|---------|
| Time to first ambulation (hours)                 | 18.4 $\pm$ 3.6              | 54.8 $\pm$ 8.2                | <0.001  |
| Time to independent walking with aid (days)      | 3.2 $\pm$ 1.1               | 5.8 $\pm$ 1.6                 | <0.001  |
| Time to independent bed-to-chair transfer (days) | 1.8 $\pm$ 0.7               | 3.4 $\pm$ 1.0                 | <0.001  |
| Duration of hospital stay (days)                 | 5.2 $\pm$ 1.4               | 7.8 $\pm$ 2.1                 | <0.001  |
| Time to achieve functional stair climbing (days) | 5.6 $\pm$ 1.8               | 8.4 $\pm$ 2.3                 | <0.001  |

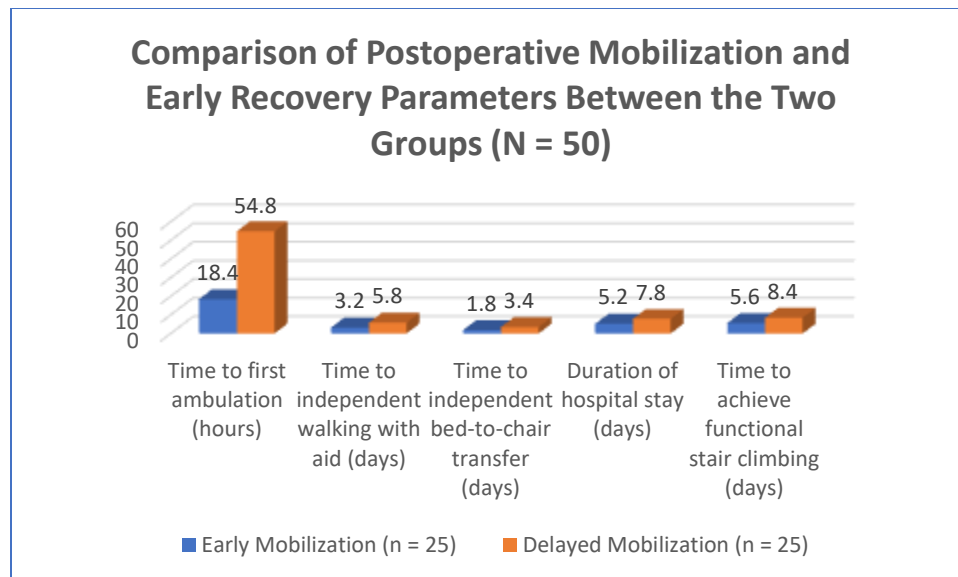


**Figure 1 Comparison of Postoperative Mobilization and Early Recovery Parameters Between the Two Groups (N = 50)**

Table 2 and Figure 1 demonstrate that patients in the early mobilization group achieved significantly faster postoperative recovery than those in the delayed mobilization group. The mean time to first ambulation was significantly shorter in the early mobilization group ( $18.4 \pm 3.6$  versus  $54.8 \pm 8.2$  hours;  $p < 0.001$ ). Similarly, independent walking with aid was achieved earlier ( $3.2 \pm 1.1$  versus  $5.8 \pm 1.6$  days;  $p < 0.001$ ), along with independent bed-to-chair transfer ( $1.8 \pm 0.7$  versus  $3.4 \pm 1.0$  days;  $p < 0.001$ ). The mean hospital stay was significantly shorter in the early mobilization group ( $5.2 \pm 1.4$  versus  $7.8 \pm 2.1$  days;  $p < 0.001$ ). Functional stair climbing was also achieved earlier ( $5.6 \pm 1.8$  versus  $8.4 \pm 2.3$  days;  $p < 0.001$ ).

**Table 3. Comparison of Harris Hip Score at Different Follow-up Intervals Between the Two Groups (N = 50)**

| Follow-up Interval                    | Early Mobilization (n = 25) | Delayed Mobilization (n = 25) | p-value |
|---------------------------------------|-----------------------------|-------------------------------|---------|
| Preoperative                          | 42.6 $\pm$ 7.8              | 41.9 $\pm$ 8.2                | 0.759   |
| 6 weeks                               | 68.4 $\pm$ 8.2              | 59.6 $\pm$ 9.1                | <0.001  |
| 3 months                              | 82.6 $\pm$ 7.4              | 74.2 $\pm$ 8.3                | <0.001  |
| 6 months                              | 91.2 $\pm$ 5.8              | 85.4 $\pm$ 7.1                | 0.003   |
| Improvement from baseline to 6 months | 48.6 $\pm$ 8.4              | 43.5 $\pm$ 9.2                | 0.046   |

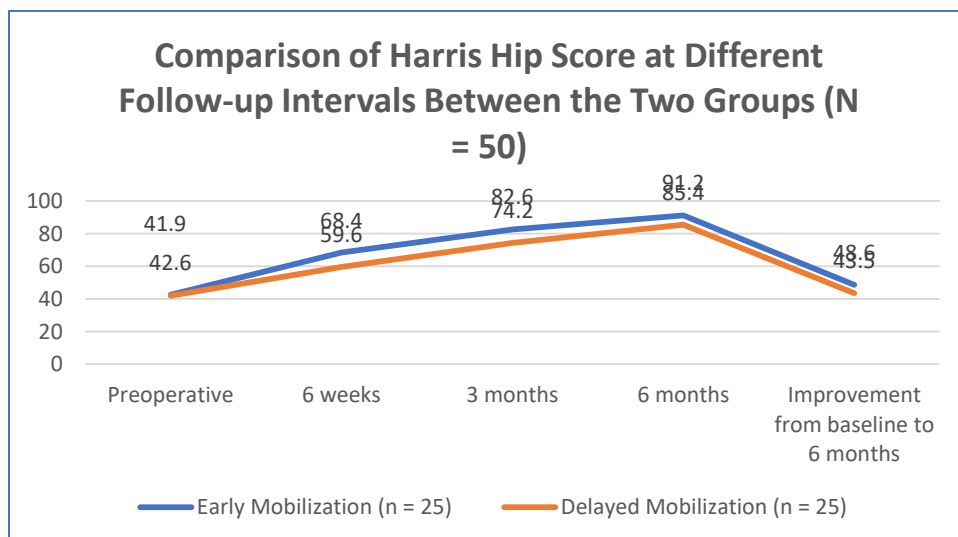


**Figure 2 Comparison of Harris Hip Score at Different Follow-up Intervals Between the Two Groups (N = 50)**

As presented in Table 3 and Figure 2, both groups demonstrated progressive improvement in Harris Hip Scores during follow-up, with consistently higher scores in the early mobilization group. At 6 weeks, the mean score was  $68.4 \pm 8.2$  in the early mobilization group compared with  $59.6 \pm 9.1$  in the delayed mobilization group ( $p < 0.001$ ). This difference persisted at 3 months ( $82.6 \pm 7.4$  versus  $74.2 \pm 8.3$ ;  $p < 0.001$ ) and 6 months ( $91.2 \pm 5.8$  versus  $85.4 \pm 7.1$ ;  $p = 0.003$ ). The mean improvement from baseline to 6 months was significantly greater in the early mobilization group ( $48.6 \pm 8.4$  versus  $43.5 \pm 9.2$ ;  $p = 0.046$ ), indicating better functional recovery.

**Table 4. Comparison of Postoperative Pain Scores (VAS) Between the Two Groups (N = 50)**

| Assessment Interval | Early Mobilization (n = 25) | Delayed Mobilization (n = 25) | p-value |
|---------------------|-----------------------------|-------------------------------|---------|
| Postoperative Day 1 | $5.8 \pm 1.2$               | $6.1 \pm 1.3$                 | 0.400   |
| Postoperative Day 3 | $4.2 \pm 1.1$               | $5.1 \pm 1.2$                 | 0.008   |
| Postoperative Day 7 | $2.8 \pm 0.9$               | $3.8 \pm 1.1$                 | 0.001   |
| 6 weeks             | $1.8 \pm 0.7$               | $2.6 \pm 0.9$                 | 0.001   |
| 3 months            | $1.1 \pm 0.6$               | $1.7 \pm 0.8$                 | 0.004   |
| 6 months            | $0.5 \pm 0.5$               | $0.9 \pm 0.7$                 | 0.024   |

Table 4 shows a progressive reduction in postoperative pain scores in both groups. On postoperative day 1, the mean VAS score was comparable between the early and delayed mobilization groups ( $5.8 \pm 1.2$  versus  $6.1 \pm 1.3$ ;  $p = 0.400$ ). However, significantly lower pain scores were observed in the early mobilization group from postoperative day 3 onward. The mean VAS scores were  $4.2 \pm 1.1$  versus  $5.1 \pm 1.2$  on day 3 ( $p = 0.008$ ) and  $2.8 \pm 0.9$  versus  $3.8 \pm 1.1$  on day 7 ( $p = 0.001$ ). At 6 weeks, 3 months, and 6 months, pain scores remained significantly lower in the early mobilization group, with mean values of 1.8 versus 2.6, 1.1 versus 1.7, and 0.5 versus 0.9, respectively.

**Table 5. Comparison of Functional Outcomes and Walking Ability at 6 Months Between the Two Groups (N = 50)**

| Parameter                                 | Early Mobilization (n = 25) | Delayed Mobilization (n = 25) | p-value |
|-------------------------------------------|-----------------------------|-------------------------------|---------|
| Harris Hip Score category, n (%)          |                             |                               |         |
| Excellent (90–100)                        | 16 (64.0)                   | 10 (40.0)                     |         |
| Good (80–89)                              | 7 (28.0)                    | 10 (40.0)                     |         |
| Fair (70–79)                              | 2 (8.0)                     | 4 (16.0)                      |         |
| Poor (<70)                                | 0 (0.0)                     | 1 (4.0)                       |         |
| Walking ability, n (%)                    |                             |                               |         |
| Independent without aid                   | 19 (76.0)                   | 13 (52.0)                     | 0.077   |
| Walking with aid                          | 6 (24.0)                    | 12 (48.0)                     |         |
| Return to routine daily activities, n (%) |                             |                               |         |
| Complete                                  | 20 (80.0)                   | 15 (60.0)                     | 0.123   |
| Partial                                   | 5 (20.0)                    | 10 (40.0)                     |         |
| Hip flexion (degrees), Mean $\pm$ SD      | $108.4 \pm 9.2$             | $101.6 \pm 10.4$              | 0.018   |

As illustrated in Table 5, the early mobilization group demonstrated better functional outcomes at 6 months. Excellent Harris Hip Scores (90–100) were achieved by 64.0% of patients in the early mobilization group compared with 40.0% in the delayed mobilization group. Independent walking without aid was achieved by 76.0% and 52.0% of patients, respectively, although the difference was not statistically significant ( $p = 0.077$ ). Complete return to routine daily activities was observed in 80.0% of early mobilization patients compared with 60.0% of delayed mobilization patients ( $p = 0.123$ ). Mean hip flexion was significantly greater in the early mobilization group ( $108.4 \pm 9.2^\circ$  versus  $101.6 \pm 10.4^\circ$ ;  $p = 0.018$ ), suggesting improved postoperative joint mobility.

**Table 6. Comparison of Postoperative Complications Between the Two Groups (N = 50)**

| Complication, n (%)     | Early Mobilization (n = 25) | Delayed Mobilization (n = 25) |
|-------------------------|-----------------------------|-------------------------------|
| Surgical site infection | 1 (4.0)                     | 2 (8.0)                       |
| Deep vein thrombosis    | 0 (0.0)                     | 2 (8.0)                       |
| Hip dislocation         | 0 (0.0)                     | 1 (4.0)                       |
| Postoperative fall      | 1 (4.0)                     | 1 (4.0)                       |
| Pressure sore           | 0 (0.0)                     | 2 (8.0)                       |
| Pulmonary complication  | 0 (0.0)                     | 1 (4.0)                       |

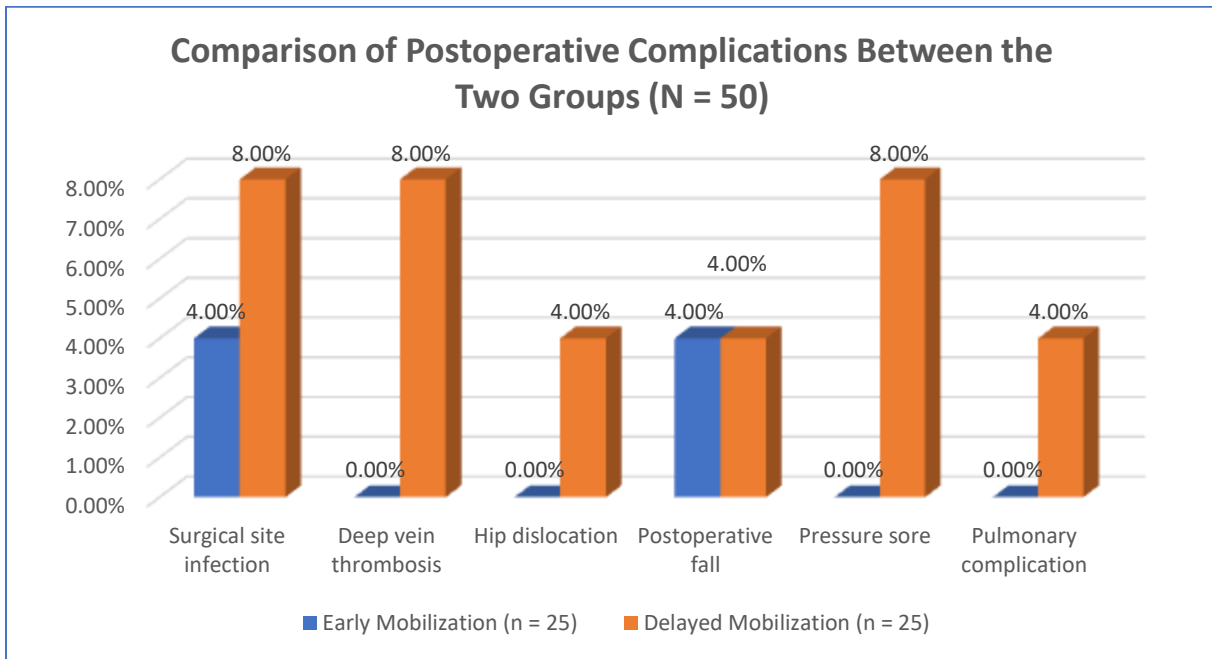


**Figure 3 Comparison of Postoperative Complications Between the Two Groups (N = 50)**

Table 6 and Figure 3 present the distribution of postoperative complications between the groups. Surgical site infection occurred in 4.0% of patients in the early mobilization group compared with 8.0% in the delayed mobilization group. Deep vein thrombosis was observed in 8.0% of delayed mobilization patients but was not reported in the early mobilization group. Similarly, hip dislocation, pressure sores, and pulmonary complications were reported only in the delayed mobilization group, affecting 4.0%, 8.0%, and 4.0% of patients, respectively. Postoperative falls occurred in 4.0% of patients in each group. Overall, fewer complications were observed descriptively in the early mobilization group; however, statistical significance could not be established because comparative p-values were not provided.

## DISCUSSION

The present comparative study evaluated functional outcomes following early versus delayed mobilization in 50 patients undergoing total hip arthroplasty (THA), with 25 patients in each group. The mean age was  $61.8 \pm 9.4$  years in the early mobilization group and  $63.2 \pm 10.1$  years in the delayed mobilization group ( $p = 0.614$ ). Both groups were comparable regarding sex distribution, BMI, affected side, indications for surgery, and preoperative Harris Hip Score (HHS). This baseline comparability supported the assessment of postoperative differences between the groups.

In the present study, the mean time to first ambulation was significantly shorter in the early mobilization group ( $18.4 \pm 3.6$  hours) than in the delayed mobilization group ( $54.8 \pm 8.2$  hours;  $p < 0.001$ ). Similarly, independent walking with an aid was achieved earlier ( $3.2 \pm 1.1$  versus  $5.8 \pm 1.6$  days), while hospital stay was shorter ( $5.2 \pm 1.4$  versus  $7.8 \pm 2.1$  days).

These findings were consistent with Efford and Samuel (2022) [16], who conducted a randomized feasibility study involving 36 patients undergoing total hip replacement. Day-zero ambulation reduced the median time to chair transfer by 39.7 hours ( $p < 0.001$ ), walking

10 metres by 24.5 hours ( $p = 0.009$ ), and independent stair climbing by 26.4 hours ( $p = 0.01$ ). Physiotherapy discharge readiness was achieved 1.04 days earlier ( $p = 0.015$ ).

Similarly, a randomized study involving 126 patients reported earlier discharge readiness following same-day mobilization compared with next-day mobilization ( $63 \pm 15$  versus  $70 \pm 18$  hours;  $p = 0.03$ ). However, the difference in actual hospital stay was not statistically significant (77 versus 87 hours;  $p = 0.11$ ).

The present study demonstrated significantly better HHS values in the early mobilization group at 6 weeks ( $68.4 \pm 8.2$  versus  $59.6 \pm 9.1$ ), 3 months ( $82.6 \pm 7.4$  versus  $74.2 \pm 8.3$ ), and 6 months ( $91.2 \pm 5.8$  versus  $85.4 \pm 7.1$ ). At 6 months, excellent functional outcomes were observed in 64% of early-mobilization patients compared with 40% of delayed-mobilization patients.

In comparison, De Leo et al. (2026) [17] evaluated 237 THA patients undergoing mobilization within 8 hours ( $n = 174$ ) or between 12 and 24 hours ( $n = 63$ ). They found no significant differences in functional mobility or walking independence between groups ( $p > 0.05$ ). Their findings suggest that mobilization within 24 hours may be sufficient, without necessarily requiring ambulation

during the first 8 hours. However, both groups in that study mobilized substantially earlier than the delayed group in the present comparison.

In the present study, VAS scores were significantly lower in the early mobilization group on postoperative day 3 ( $4.2 \pm 1.1$  versus  $5.1 \pm 1.2$ ;  $p = 0.008$ ) and at 6 months ( $0.5 \pm 0.5$  versus  $0.9 \pm 0.7$ ;  $p = 0.024$ ). Independent walking without assistance was achieved by 76% of early-mobilization patients compared with 52% of delayed-mobilization patients.

Masaracchio et al. (2017) [18], in a systematic review and meta-analysis involving 17 studies and 26,614 arthroplasty patients, reported that early rehabilitation reduced hospital stay. The pooled standardized mean difference was  $-1.90$  (95% CI:  $-2.76$  to  $-1.05$ ) across four randomized trials. These findings supported the benefits of earlier rehabilitation, although substantial heterogeneity was observed.

In the present study, deep vein thrombosis occurred in 0% of early-mobilization patients compared with 8% of delayed-mobilization patients. Surgical site infection occurred in 4% and 8%, respectively, while pressure sores occurred only in the delayed group (8%).

A literature review published in 2023, which included 16 eligible studies, identified shorter hospitalization, reduced postoperative complications, improved walking ability, and lower pain among the reported benefits of early mobilization. These observations were consistent with the direction of findings in the present study, although its small sample size limited conclusions regarding individual complications.

Overall, the presented findings suggested that early mobilization following THA was associated with faster recovery, better functional scores, reduced pain, and shorter hospitalization. Nevertheless, the observational comparison and small sample size prevented definitive causal conclusions.

### Strengths of the Study

- The study compared early and delayed mobilization in patients undergoing total hip arthroplasty using standardized functional assessment parameters.
- Both groups had comparable baseline demographic characteristics and preoperative Harris Hip Scores, supporting comparison of postoperative outcomes.
- Multiple outcomes were assessed, including hip function, postoperative pain, walking ability, time to ambulation, length of hospital stay, and postoperative complications.
- Patients were followed up for six months, allowing assessment of functional recovery at different postoperative intervals.

### Future Scope

Further multicentre studies involving larger sample sizes and randomized group allocation are recommended to confirm the benefits of early mobilization following total hip arthroplasty. Future research should evaluate long-term functional outcomes, patient satisfaction, rehabilitation adherence, and postoperative complications. Standardized mobilization protocols may also help identify the optimal timing of postoperative rehabilitation for improved patient recovery and independence.

### Limitations

The present study was limited by its relatively small sample size of 50 patients, which may have reduced the statistical power and generalizability of the findings. The single-centre study design and non-randomized group allocation may have introduced selection bias and potential confounding factors. The follow-up period of six months was insufficient to evaluate long-term functional outcomes and prosthesis-related complications. Additionally, variations in patient compliance, preoperative functional status, and rehabilitation adherence may have influenced postoperative recovery.

### DECLARATIONS

**Ethical Approval:** Ethical approval was obtained from the Institutional Ethics Committee.

**Informed Consent:** Written informed consent was obtained from all participants.

**Conflict of Interest:** The authors declare no conflict of interest.

**Funding:** No external funding was received for this study.

**Author Contributions:** All authors contributed to the study and approved the final manuscript.

**Data Availability:** Data are available from the corresponding author upon reasonable request.

**Use of Artificial Intelligence:** No artificial intelligence tools were used in the preparation of this manuscript.

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### CONCLUSION

The present study suggested that early mobilization following total hip arthroplasty was associated with significantly better functional outcomes compared with delayed mobilization. Patients in the early mobilization group demonstrated faster recovery of walking ability, higher Harris Hip Scores, reduced postoperative pain, and shorter hospital stays. Early mobilization was also associated with fewer observed postoperative complications, although the small sample size limited definitive conclusions. These findings support the potential benefits of incorporating early, supervised

mobilization into postoperative rehabilitation protocols to improve functional recovery and patient independence following total hip arthroplasty.

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