

The Effectiveness of Preoperative Physical Therapy in Improving Postoperative Outcomes for Patients Undergoing Total Hip Replacement Surgery

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Abstract:

This retrospective cohort study investigated the impact of preoperative physical therapy on postoperative outcomes for patients undergoing total hip replacement surgery. The study compared 150 patients who either received preoperative physical therapy or did not before surgery. Findings revealed that patients in the intervention group exhibited lower postoperative pain levels, improved range of motion, muscle strength, and enhanced functional independence compared to the control group. These results underscore the potential benefits of preoperative physical therapy in optimizing recovery following total hip replacement surgery.

Keywords: preoperative physical therapy, total hip replacement surgery, postoperative outcomes, pain management, range of motion, muscle strength, functional independence.

Introduction

Total hip replacement surgery, or total hip arthroplasty, is a commonly performed procedure aimed at alleviating debilitating hip joint pain and dysfunction. While surgical advancements have led to favorable outcomes, the postoperative recovery process significantly influences the overall success of the surgery. Preoperative physical therapy has emerged as a promising strategy to optimize patient outcomes and enhance recovery following total hip replacement surgery (Czyżewska et al., 2014).

Studies indicate that engaging in targeted exercise programs before surgery can result in improvements in muscle strength, range of motion, and functional capacity. These preoperative interventions aim to address muscle imbalances, enhance joint mobility, and improve overall physical fitness to better prepare individuals for the challenges of rehabilitation post-surgery (Moyer et al., 2017).

Literature Review

Total hip replacement surgery is a common orthopedic procedure, with postoperative rehabilitation playing a critical role in patient recovery and functional outcomes. The utilization of preoperative physical therapy has garnered increased attention as a potential strategy to enhance postoperative recovery following total hip replacement surgery.

A systematic review by Czyżewska et al. (2014) highlighted the significant benefits of preoperative physiotherapy preparation in hip surgery patients. The review encompassed various studies demonstrating improvements in muscle strength, joint range of motion, and functional capacity in patients who underwent preoperative physical therapy interventions. These findings suggest that targeted exercises before surgery can contribute to better postoperative outcomes.

Similarly, Moyer et al. (2017) conducted a systematic review focusing on preoperative physical therapy for patients undergoing total hip arthroplasty. The review emphasized the importance of preoperative interventions in addressing muscle imbalances and enhancing joint mobility, which are crucial factors in optimizing patient readiness for the rehabilitation phase post-surgery.

Furthermore, a study by Vasta et al. (2020) compared outcomes between patients who received preoperative physical therapy and those who did not. The results indicated that patients who participated in preoperative physical therapy experienced shorter hospital stays, reduced postoperative pain levels, and improved functional independence during the recovery period.

Overall, the existing literature suggests that preoperative physical therapy interventions play a valuable role in improving postoperative outcomes for patients undergoing total hip replacement surgery. By addressing physical impairments, enhancing functional capacity, and better preparing individuals for the challenges of rehabilitation, preoperative physical therapy holds promise in optimizing patient recovery and long-term surgical success.

Methodology

Study Design:

This study employed a retrospective cohort design to investigate the impact of preoperative physical therapy on postoperative outcomes in patients undergoing total hip replacement surgery. Data collection and analysis were conducted over a period of 18 months.

Participants:

The study included a sample of 150 patients who underwent total hip replacement surgery at military hospital. Patients were divided into two groups: the intervention group, consisting of individuals who participated in a structured preoperative physical therapy program, and the control group, comprising patients who did not receive preoperative physical therapy.

Intervention:

The preoperative physical therapy program included tailored exercises focused on improving muscle strength, joint flexibility, and functional mobility. Participants attended three sessions per week for six weeks leading up to their surgery date. The therapy sessions were supervised by senior physical therapists and tailored to each individual's specific needs and surgical requirements.

Outcome Measures:

Postoperative outcomes were assessed at multiple time points, including immediately post-surgery, one month, three months, and six months post-surgery. Outcome measures included pain levels, range of motion, muscle strength, functional independence, and quality of life assessments. Data were collected through standardized outcome measures, patient self-reports, and medical records review.

Data Analysis:

Descriptive statistics were used to summarize demographic information and baseline characteristics of the study participants. A series of independent t-tests and chi-square tests were conducted to compare postoperative outcomes between the intervention and control groups at each time point. Repeated measures analysis of variance (ANOVA) was used to examine changes in outcomes over time within each group.

Ethical Considerations:

This study received approval from the ethics committee to ensure adherence to ethical principles and protection of participants' rights. Informed consent was obtained from all participants prior to their inclusion in the study, and data confidentiality was maintained throughout the research process.

Limitations:

Some limitations of the study include the potential for selection bias, the retrospective nature of the cohort design, and the reliance on self-reported outcome measures. Future research may benefit from a randomized controlled trial design with a larger sample size and longer follow-up periods.

Findings

1. Demographics and Baseline Characteristics

Group	Age (Mean \pm SD)	Gender (Male/Female)	BMI (Mean \pm SD)	Preoperative Pain Levels (1-10)
Intervention	63 \pm 5	40/35	28.5 \pm 2.3	7.2 \pm 1.1
Control	64 \pm 4	42/33	29.0 \pm 2.5	7.4 \pm 1.0

2. Postoperative Pain Levels

Time Point	Intervention Group (Mean \pm SD)	Control Group (Mean \pm SD)
1 month	3.2 \pm 0.8	4.1 \pm 0.9
3 months	2.1 \pm 0.6	3.5 \pm 0.7
6 months	1.5 \pm 0.4	2.9 \pm 0.6

3. Range of Motion and Muscle Strength

Group	Hip Range of Motion (Degrees) - Baseline	Hip Range of Motion (Degrees) - 6 months	Muscle Strength (lbs) - Baseline	Muscle Strength (lbs) - 6 months
Intervention	90 \pm 10	120 \pm 10	50 \pm 5	70 \pm 7
Control	88 \pm 9	110 \pm 12	48 \pm 4	65 \pm 6

4. Functional Independence and Quality of Life

Group	Functional Independence (Mean \pm SD) - 6 months	Quality of Life (1-100) - 6 months
Intervention	90 \pm 5	85
Control	78 \pm 6	75

Discussion

The findings of this study support the potential benefits of preoperative physical therapy in enhancing postoperative outcomes for patients undergoing total hip replacement surgery. The results revealed that patients who participated in a structured preoperative physical therapy program experienced several positive outcomes compared to those who did not receive preoperative intervention.

The first notable finding was the significant reduction in postoperative pain levels among patients in the intervention group. Consistent with previous literature (Vasta et al, 2020), our study demonstrated that preoperative physical therapy may help manage pain more effectively post-surgery, potentially leading to improved patient comfort and satisfaction during the recovery period.

Additionally, the improvements in range of motion and muscle strength observed in the intervention group align with the findings of Czyżewska et al. (2014) and Moyer et al. (2017), indicating that preoperative physical therapy plays a crucial role in optimizing physical function and mobility before surgery. Enhanced

muscle strength and joint flexibility are paramount for a successful rehabilitation process and may contribute to long-term functional outcomes.

Furthermore, the superior functional independence and quality of life reported by patients in the intervention group highlight the holistic benefits of preoperative physical therapy. Addressing functional limitations and improving quality of life are essential components of patient-centered care and may lead to better overall outcomes and satisfaction following total hip replacement surgery.

It is essential to acknowledge some limitations of this study, including its retrospective cohort design, potential selection bias, and reliance on self-reported outcome measures. Future research employing a randomized controlled trial design with a larger sample size and longer follow-up periods could provide further insights into the long-term effects of preoperative physical therapy on postoperative outcomes.

Conclusion

The results of this study underscore the potential effectiveness of preoperative physical therapy in improving postoperative outcomes for patients undergoing total hip replacement surgery. Integrating preoperative physical therapy into the standard care pathway may lead to enhanced pain management, improved physical function, and better quality of life for patients undergoing total hip arthroplasty.

References

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