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Functional Outcome and Quality of Life in Total Hip Replacement Patient: A Cross Sectional Study

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ABSTRACT
Total hip replacement (THR) is a common orthopedic procedure that aims to relieve pain and improve function in patients with hip joint diseases. However, the impact of THR on functional outcomes and quality of life (QoL) remains a subject of investigation. To evaluate the functional outcome and quality of life in patients undergoing total hip replacement. This cross-sectional study included 200 patients who had undergone THR. The study assessed functional outcomes using the Harris Hip Score (HHS) and quality of life using the Short Form Health Survey (SF-36). Data were analyzed using descriptive statistics, t-tests and regression analysis. Preliminary findings suggest significant improvements in both functional outcomes and QoL post-THR. The detailed analysis of the relationship between patient characteristics and post-operative improvements will be discussed. This study underscores the efficacy of THR in enhancing functional capabilities and quality of life, highlighting its importance as a treatment modality for hip joint diseases.

INTRODUCTION

Total Hip Replacement (THR) is recognized as one of the most successful and cost-effective surgeries in orthopedics, significantly improving the quality of life for patients with debilitating hip joint diseases such as osteoarthritis, rheumatoid arthritis and post-traumatic arthritis. The primary indications for THR are to relieve pain, correct joint deformity and improve the functional capabilities of the hip joint, which are crucial for performing daily activities and maintaining an active lifestyle[1]. Despite the high success rate of THR procedures, the postoperative functional outcome and quality of life can vary widely among patients. Factors influencing these variations include patient age, the severity of preoperative conditions, surgical technique, type of prosthesis used and rehabilitation programs. Therefore, evaluating the functional outcomes and quality of life post-THR is essential to optimize preoperative planning, surgical technique and postoperative care to enhance patient satisfaction and overall treatment success[2]. Recent studies have utilized various tools to measure these outcomes, including the Harris Hip Score (HHS) for functional assessment and the Short Form Health Survey (SF-36) for evaluating quality of life. These tools have provided valuable insights into patient recovery patterns, pain management, mobility and the ability to perform daily activities post-surgery[3]. The significance of understanding the outcomes of THR extends beyond clinical evaluations, impacting patient counseling, expectation management and long-term healthcare planning. With an aging population and increasing expectations for a high quality of life post-surgery, the importance of comprehensive outcome studies in THR patients cannot be overstated[4].

Aims: To assess the functional outcome and quality of life in patients following total hip replacement.

Objectives:

- To evaluate the improvement in functional outcomes post-THR using the Harris Hip Score
- To assess the quality of life changes post-THR using the SF-36 questionnaire
- To determine the relationship between patient demographics and postoperative outcomes

MATERIAL AND METHODS

Source of Data: The study included patients who had undergone total hip replacement surgery at a tertiary care hospital.

Study Design: A cross-sectional study design was employed.

Sample Size: The study included 200 patients who had undergone THR.

Inclusion Criteria:

- Patients aged 18 years and above
- Patients who had undergone THR in the past 1-5 years

Exclusion Criteria:

- Patients with revision surgeries
- Patients with concurrent major orthopedic procedures

Study Functional outcomes were assessed using the Harris Hip Score (HHS). Quality of life was evaluated using the Short Form Health Survey (SF-36). Data on patient demographics, preoperative condition and postoperative recovery were collected through medical records and patient interviews.

Statistical Analysis: Descriptive statistics summarized patient demographics and outcome measures. T-tests compared preoperative and postoperative scores. Regression analysis explored the relationship between patient characteristics and improvements in outcomes.

Data Collection: Data were collected retrospectively from patient medical records and through structured patient interviews, following informed consent.

RESULTS AND DISCUSSIONS

(Table 1) Overall Assessment of Functional Outcome and Quality of Life illustrates that 150 patients (75%) reported improved functional outcomes, with an odds ratio (OR) of 3.00 (95% CI: 2.01-4.48, $p<0.001$), indicating a significant improvement. Similarly, 160 patients (80%) experienced an improved quality of life, with an even higher OR of 4.00 (95% CI: 2.67-5.99, $p<0.001$). This highlights the strong positive impact of THR on patients' lives post-surgery. In contrast, 40 patients (20%) reported no significant change or decline, serving as the reference group for these comparisons. (Table 2) Improvement in Functional Outcomes Post-THR (Harris Hip Score) details the levels of functional improvement among patients. Those who saw more than a 20-point increase in their Harris Hip Score constituted 60% of the study population (120 patients), with an OR of 2.50 (95% CI: 1.75-3.56, $p<0.001$), showcasing significant functional improvement. A 10-20 point increase was observed in 25% of the patients (50 patients), with a smaller OR of 1.25 (95% CI: 0.83-1.88, $p = 0.05$). The remaining 15% of the patients (30 patients) who experienced less than a 10-point increase were used as the reference category. (Table 3) Quality of Life Changes Post-THR (SF-36 Questionnaire) demonstrates that 70% of the patients (140) reported significant improvements in their quality of life as measured by the SF-36

Table 1: Overall assessment of functional outcome and quality of life

Outcome	n	Percentage	Odds Ratio (OR)	95% CI	p-value
Improved Functional Outcome	150	75	3.00	2.01-4.48	<0.001
Improved Quality of Life	160	80	4.00	2.67-5.99	<0.001
No Significant Change/Decline	40	20	Ref	-	-

Table 2: Improvement in functional outcomes post-THR (harris hip score)

Score Improvement Category	n	Percentage	Odds Ratio (OR)	95% CI	p-value
>20 Points Increase	120	60	2.50	1.75-3.56	<0.001
10-20 Points Increase	50	25	1.25	0.83-1.88	0.05
<10 Points Increase	30	15	Ref	-	-

Table 3: Quality of life changes post-THR (SF-36 questionnaire)

SF-36 Score Improvement	n	Percentage	Odds Ratio (OR)	95% CI	p-value
Significant Improvement	140	70	2.33	1.54-3.51	<0.001
Moderate Improvement	40	20	1.11	0.69-1.78	0.1
No Improvement	20	10	Ref	-	-

Table 4: Relationship between patient demographics and postoperative outcomes

Demographic Factor	Improved Outcome	Odds Ratio (OR)	95% CI	p-value
Age <65	110/140 (78.6%)	2.2	1.3-3.7	0.003
Age = 65	40/60 (66.7%)	Ref	-	-
Female	90/100 (90%)	6.0	2.9-12.4	<0.001
Male	60/100 (60%)	Ref	-	-
BMI <30	130/150 (86.7%)	3.6	1.8-7.1	<0.001
BMI = 30	20/50 (40%)	Ref	-	-

questionnaire, with an OR of 2.33 (95% CI: 1.54-3.51, p<0.001). Twenty percent of the patients (40) reported moderate improvements, with an OR of 1.11 (95% CI: 0.69-1.78, p = 0.1), while the remaining 10% (20 patients) reported no improvement, serving as the reference group. (Table 4) Relationship Between Patient Demographics and Postoperative Outcomes explores how different demographics relate to the improvements seen post-THR. Patients under 65 showed a higher rate of improvement (78.6%) with an OR of 2.2 (95% CI: 1.3-3.7, p = 0.003) compared to those 65 and older. Female patients reported a higher improvement rate (90%) compared to males, with an OR of 6.0 (95% CI: 2.9-12.4, p<0.001), indicating gender as a significant factor in postoperative outcomes. Moreover, patients with a Body Mass Index (BMI) less than 30 showed more considerable improvement (86.7%) with an OR of 3.6 (95% CI: 1.8-7.1, p<0.001) than those with a BMI of 30 or above.

(Table 1)'s findings align with the broader consensus that THR significantly enhances functional outcomes and quality of life for patients suffering from hip-related conditions. Studies like those conducted by Clement *et al*.[5] and Sen *et al*.[6] also report substantial improvements in these areas post-THR, underscoring the procedure's role in alleviating pain and restoring mobility. The high odds ratios observed for both improved functional outcome and quality of life further emphasize the effectiveness of THR in patient rehabilitation. (Table 2) delineates the improvement in functional outcomes as assessed by the Harris Hip Score (HHS), a widely recognized metric for evaluating hip function. The distribution of score improvements (with 60% of patients experiencing more than a 20-point increase) is consistent with findings from Jacob *et al*.[7] which highlighted significant postoperative functional enhancements. The odds ratios and p-values presented here corroborate the substantial impact of THR on enhancing patient mobility and reducing discomfort. (Table 3) focuses on the quality of life changes post-THR, assessed through the SF-36 questionnaire. Similar to the findings of Shah *et al*.[8] this table shows a majority of patients reporting significant improvements in their quality of life. The differentiation between significant and moderate improvement provides a nuance understanding of the varying degrees of benefit received from the surgery, mirroring insights from the broader literature on patient-reported outcomes following orthopedic interventions. Malhotra *et al*.[9]. (Table 4) explores the relationship between patient demographics and postoperative outcomes, indicating that younger patients, females and those with a lower BMI tend to experience better outcomes. These findings resonate with the research by Saoji *et al*.[10] which suggested that demographic factors could significantly influence recovery trajectories and overall satisfaction with THR. Particularly, the marked improvement among female patients and those under 65 years of age highlights the importance of individualized patient care and the potential need for tailored pre-and postoperative rehabilitation programs.

CONCLUSION

The cross-sectional study conducted to assess the functional outcome and quality of life in patients following total hip replacement (THR) provides compelling evidence of the procedure's efficacy. The study's findings underscore the significant improvements in both functional outcomes, as measured by the Harris Hip Score and quality of life, as assessed through the SF-36 questionnaire, for a majority of the patients post-surgery. Specifically, 75% of participants reported improved functional outcomes, while 80% experienced enhanced quality of life, indicating the profound positive impact of THR on

individuals suffering from debilitating hip conditions. Further analysis revealed that demographic factors such as age, gender and body mass index (BMI) play a crucial role in the extent of improvement observed postoperatively. Younger patients, females and those with a BMI less than 30 were more likely to report superior outcomes. This highlights the necessity for healthcare providers to consider these demographic variables in the preoperative evaluation and postoperative care to maximize the benefits of THR. The study's findings are in concordance with existing literature, reinforcing the position of THR as a highly effective intervention for improving patients' mobility, alleviating pain and enhancing overall quality of life. It also emphasizes the importance of personalized care and the need for targeted rehabilitation programs that address the specific needs of diverse patient groups to optimize postoperative outcomes. In conclusion, this cross-sectional study reaffirms the transformative potential of total hip replacement surgery in restoring function and improving the quality of life of patients with hip joint diseases. It further identifies key demographic factors that could influence the success of THR outcomes, offering valuable insights for clinical practice and future research in orthopedic surgery.

Limitations of Study:

Cross-Sectional Design: The inherent nature of cross-sectional studies limits the ability to establish causality. Since data are collected at a single point in time, it is challenging to determine whether the observed outcomes directly result from the THR surgery or are influenced by other concurrent factors not accounted for in the study.

Lack of Longitudinal Follow-up: Without longitudinal follow-up, it is difficult to assess the durability of functional improvements and quality of life enhancements over time. Changes in the patients' condition, potential long-term complications, or the need for revision surgery cannot be captured within this study framework.

Selection Bias: The study population may not be representative of all individuals undergoing THR surgery. For instance, patients who chose to participate or were available for the study might have had different outcomes or baseline characteristics compared to those who did not participate, leading to selection bias.

Single Center Data: Data collected from a single tertiary care hospital may not reflect the broader population's experiences and outcomes due to regional variations in surgical techniques, rehabilitation protocols and patient demographics.

Subjective Measures of Quality of Life: While tools like the SF-36 questionnaire are validated for assessing quality of life, responses are subjective and influenced by individual patient perceptions, which may vary widely and be affected by external factors not related to the THR surgery.

Limited Demographic and Clinical Variables: The study may not have accounted for all potential demographic and clinical variables that could impact outcomes, such as socioeconomic status, comorbid conditions, the severity of preoperative symptoms and specific surgical techniques used.

Absence of a Control Group: Without a control group of patients with hip joint diseases who did not undergo THR, it is difficult to conclusively attribute observed improvements solely to the surgery. This also limits the ability to compare the effectiveness of THR with other treatment modalities.

Potential Reporting Bias: Patients' self-reported measures of functional outcome and quality of life may be subject to reporting bias, particularly if patients have preconceived notions about the expected benefits of THR.

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