International Journal of Research in Orthopaedics
Vaibhav et al. Int J Res Orthop. 2026 Jul;12(4):1008-1011
https://www.ijoro.org

Original Research Article

DOI: https://dx.doi.org/10.18203/issn.2455-4510.IntJResOrthop20262031

Functional outcome, disability and quality of life after primary total hip arthroplasty: a prospective cohort study from North India

Vaibhav*, Lokesh Thakur, Vipan K. Dumpha, Jasbir Singh, Rajat

Department of Orthopaedics, Dr. Rajendra Prasad Government Medical College, Kangra, Himachal Pradesh, India

Received: 17 March 2026
Revised: 16 April 2026
Accepted: 22 May 2026

***Correspondence:**
Dr. Vaibhav,
E-mail: vaibhavkumar2567@gmail.com

ABSTRACT

Background: Total hip arthroplasty (THA) is an established intervention for end-stage hip diseases. While functional outcomes are well documented, there are limited Indian data comprehensively evaluating disability and quality of life using validated patient-reported outcome measures (PROMs). This study aimed to prospectively assess functional outcomes, disability, and quality of life following primary total hip arthroplasty in a North Indian population.
Methods: In this prospective cohort study, 56 patients who underwent primary THA at Dr. Rajendra Prasad Government Medical College during the period of January 2022 to October 2023 were evaluated preoperatively and at 2 weeks, 6 weeks, 3 months, 6 months,1 year and 1.5 years postoperatively. Functional outcomes were assessed using the Harris hip score (HHS), disability using the World Health Organization (WHO) disability assessment schedule 2.0 (WHODAS 2.0), and quality of life using the WHOQOL-BREF. Statistical analysis was performed using a paired t-test. Statistical significance was set at $p<0.05$.
Results: The mean HHS improved from 48.25 preoperatively to 89.25 at the final follow-up, representing an improvement of 86% in function. The mean WHODAS score decreased from 37.6 to 5.58 at the final follow-up, representing an 85% reduction in disability. All WHOQOL-BREF domains showed significant improvement.
Conclusion: Primary THA significantly improves hip function, reduces disability, and enhances the quality of life. A Comprehensive PROM -based assessment provides a multidimensional evaluation of surgical outcomes in the Indian population.

Keywords: Total hip arthroplasty, Functional outcome, Quality of life, Disability

INTRODUCTION

Total hip arthroplasty (THA) is one of the most successful orthopedic procedures for end-stage hip diseases including osteoarthritis, avascular necrosis (AVN), and fracture neck of the femur, relieving millions of people from incapacitating pain arising from the hip joint.[1] The first total hip replacement is thought to have been done in London by Phillip Wiles in 1938.[2] The procedure was further developed in the 1950s by McKee and Farrar which was later developed by Sir John Charnley in the late 1960s.[3-5] Estimates of the lifetime risk of undergoing THA have been found to vary by country, with rates ranging from 8.7% to 15.9% in women and 6.3% to 8.6% in men.[6,7] In India, a nation with a population exceeding 1.4 billion, hip arthritis imposes a substantial burden, compounded by AVN and femoral neck fractures, particularly in younger patients due to trauma.

Beyond pain relief and mobility restoration, contemporary outcome assessment emphasizes patient-reported outcome measures (PROMs) that evaluate disability and quality of life, in addition to functional recovery.

Although several studies have reported functional outcomes following THA, limited Indian literature simultaneously evaluates functional status, disability, and

quality of life using validated instruments in a prospective design. Therefore, the present study was undertaken to comprehensively assess these parameters in a North Indian population.

METHODS

Study design

Prospective open cohort study conducted at Dr Rajendra Prasad Government Medical college Kangra, Himachal Pradesh, India.

The sample size was calculated based on an expected mean improvement of 20 points in HHS with a standard deviation of 25, at 80% power and 5% alpha error, yielding a minimum required sample size of 48. Considering a 10% loss to follow-up, 56 patients were finally included in the study.

Study period

The study period was between January 2022 to October 2023.

Study centre

The study was conducted at Dr. Rajendra Prasad Government Medical College, Kangra, Himachal Pradesh, India.

Follow-up

Follow-up was minimum 6 months.

Inclusion criteria

Inclusion criteria included individual aged >18 years, primary THR for osteoarthritis, AVN, or fracture neck femur and willing for follow-up.

Exclusion criteria

Exclusion criteria included individual with revision THR, active infection and neuromuscular gait disorders

Outcome measures

Harris hip score (HHS)

It evaluates pain, function, deformity, and range of motion. Scores range from 0 to 100, with higher scores indicating better outcomes.

WHO disability assessment schedule 2.0 (WHODAS 2.0)

A standardized tool for evaluating activity limitations and participation across six domains.

WHOQOL-BREF

Quality of life was evaluated using the questionnaire, which measures quality of life across four domains: physical, psychological, social, and environmental factors.

Statistical analysis

Data analyzed using statistical package for the social sciences (SPSS) version (IBM SPSS 28). Continuous variables expressed as mean±SD. Pre- and post-operative scores compared using paired t-test. Confidence intervals calculated where applicable.

Surgical procedure

All procedures were performed by experienced orthopedic surgeons at the same institution using the posterolateral approach to the hip. The choice of implant (cemented or uncemented) was determined by the operating surgeon based on the patient's characteristics and bone quality.

Rehabilitation

Standard rehabilitation protocols were followed in all patients except those with complications requiring a patient-specific approach.

RESULTS

The study included 56 participants who were assessed preoperatively and post operatively on OPD basis to evaluate the functional outcome using Harris hip score, satisfaction through WHO-disability schedule 2.0, and quality of life using WHOQOL-BREF scoring system.

Mean age was 50.30 years. Gender distribution included males 80.4% and females 19.6%. Functional outcome showed that HHS improved significantly from 48.25 to ~90 ($p<0.001$). Disability WHODAS score reduced from 37.6 to 5.58 ($p<0.001$) (Tables 1-3).

Table 1: Demographic characteristics: gender wise distribution of study subjects (n=56).

Gender	No.	%
Male	45	80.4
Female	11	19.6

Quality of life showed significant improvements in the physical, psychological, social, and environmental domains.

Subgroup analysis comparing AVN and fracture neck of femur demonstrated comparable improvements in HHS at the final follow-up (Table 4). The overall complication rate was 5.4%, including one superficial infection, one septic loosening, and one stem perforation. No mortality was observed in this study (Table 5).

Table 2: Change in Harris hip score at different follow-up interval (n=56).

Harris hip score	Mean±SD	Median (IQR)	P value
Preop	48.25±22.38	56 (46-64)	-
2 weeks	64.96±11.42	64 (60-74)	<0.001
6 weeks	71.93±9.13	72 (68-80)	<0.001
12 weeks	77.54±9.24	80 (74-84)	<0.001
6 months	82.54±9.25	84 (82-88)	<0.001
1 year	86.35±2.47	88 (84-88)	<0.001
1.5 year	89.82±2.08	90 (88-92)	<0.001

Table 3: Change in WHO DAS score across follow-up intervals (n=56).

WHO DAS score	Mean±SD	Median (IQR)	P value
Preop	37.84±5.25	38 (36-40)	-
2 weeks	31.11±4.17	30.5 (28-34)	<0.001
6 weeks	26.30±4.23	27 (22.5-29)	<0.001
12 weeks	22.09±7.05	20 (18-24)	<0.001
6 months	18.60±8.65	18 (16-20)	<0.001
1 year	8.50±4.34	7 (6-10.25)	<0.001
1.5 year	5.58±1.73	5.5 (4-7.5)	<0.001

Table 4: WHOQOL-BREF domain scores across follow-up intervals (n=56).

Follow-up interval	Domain I (physical), mean±SD	Domain II (psychological), mean±SD	Domain III (social), mean±SD	Domain IV (environmental), mean±SD	P value
Preoperative	16.45±10.08	16.52±8.48	17.25±7.64	17.39±7.57	–
2 weeks	39.66±8.55	33.96±12.93	35.55±9.34	37.79±9.68	<0.001
6 weeks	55.57±8.05	52.79±13.20	56.43±11.20	58.20±11.18	<0.001
12 weeks	70.48±6.28	68.63±11.55	70.41±9.02	72.52±11.99	<0.001
6 months	91.45±8.37	81.48±9.97	81.14±13.31	87.57±13.89	<0.001
1 year	94.30±4.11	85.15±5.74	83.70±7.29	90.80±8.71	<0.001
1.5 years	96.70±4.15	89.31±3.77	90.46±6.76	99.08±2.25	<0.001

Table 5: Postoperative complications in study subjects (n=56).

Complications	No.	%
Infection	1	1.8
Nil	53	94.6
Septic loosening	1	1.8
Stem perforation	1	1.8

DISCUSSION

This study demonstrated significant and sustained improvements in hip function, disability reduction, and quality of life enhancement following primary THA. The improvements were evident as early as the second postoperative week and continued progressively up to 1.5 years of follow-up, indicating both early and durable benefits of the procedure. The use of three validated instruments provided a comprehensive assessment.

The mean age of the study participants in our study was 50.30 years, whereas the mean age of patients in the study by Engelbert and his colleagues among 134 patients was 59.2 years (range 25 to 85 years) mainly due to improvement in health facilities and earlier diagnosis. In our study, AVN was the most common cause of hip replacement (64.3%), followed by fracture neck of femur (17.9%).[8] Most studies have reported AVN as the most common indication for hip replacement.[9] The inclusion of three scores for the evaluation of results, assessment of disability, and quality of life makes this study novel. The mean preoperative HHS was 48.25, reflecting substantial functional limitations which improved to 89.82 at the final follow-up, representing a clinically meaningful gain. These findings are comparable to previously reported improvements in functional outcomes after THA by Vinjamuri in the Indian population, demonstrating consistency in results among regional cohorts.[10] Likewise, Li et al observed in their study that there was a significant improvement in the functional outcome of their study participants having necrosis of femoral head using modified Harris hip score after THA.[11] This is comparable to the study conducted by Peters et al, who reported an improvement from 54 points preoperatively to 84 points at the time of the last follow-up. All these studies are comparable to our study. In addition to functional recovery, we also assessed the disability score of our study participants using the WHO disability assessment schedule 2.0 both pre-and postoperatively at various follow-ups, which showed a great decline in disability, thus making the individual free from incapacitating pain and allowing reintegration into daily life. There is a dearth of literature estimating the satisfaction level of patients after THR. Therefore, this study is novel in its own kind in that it suggests that THA benefits extend beyond pain relief and mobility restoration to meaningful improvement in independence and societal participation. Lastly, we also assessed the quality of life using the WHO-BREF scoring system, which considers four domains: physical health, psychological health, social relationships, and environmental scores that encompass every possible aspect of a patient's being, to evaluate the ultimate outcome of any intervention for a disease. It has shown cultural adaptability and validity in certain interventions,

such as surgeries for acetabular and hip fractures.[12] We used three types of prosthesis in our study participants viz cemented, uncemented and hybrid, of which uncemented prosthesis was used most commonly because the mean age of study participants was 50.30 i.e. comparatively younger age group with good bone stock. Abdulkarim et al in their study concluded that cemented vs uncemented THR gave similar results.[13] The better results in the three domains could be explained by the fact that these surgeries are mostly performed when the hips are increasingly damaged and the patients are debilitated to an extent where they cease to have a fruitful social and environmental life, along with psychological deficits. Therefore, once their pain and debility diminish post THRs, they report significantly high mental and social improvements. In our study there is a marked improvement in domain 1 and domain 4 i.e. physical status and environmental which can be explained by the fact that pain decrease after THR and the study being done in hilly area the need for environmental security as well as transportation is a priority.

Strengths

The strength of the study was that it utilizes a prospective design and validated outcome tools.

Limitations

Limitations were modest sample size, single-center design, and short follow-up duration.

CONCLUSION

Primary THR significantly improves function, reduces disability, and enhances quality of life.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Harkess JW, Crocaralle JR. Arthroplasty of the hip. In: Canale T, editor. Campbell's operative orthopaedics. 10th ed. International ed. St. Louis: Mosby. 2013:180-290.
2. Petty W. Total joint replacement-VI: lower extremity replacement. The hip. Philadelphia: WB Saunders. 1991:189-465.
3. McKee GK, Watson-Farrar J. Replacement of arthritic hips by the McKee-Farrar prosthesis. J Bone Joint Surg Br. 1966;48:245-59.
4. Charnley J. Total hip replacement. JAMA. 1974;230(7):1025-8.
5. Charnley J. Low friction arthroplasty of the hip: theory and practice. Berlin: Springer-Verlag. 1979:332-45.
6. Ackerman IN, Bohensky MA, de Steiger R, Brand CA, Eskelinen A, Fenstad AM, et al. Lifetime Risk of Primary Total Hip Replacement Surgery for Osteoarthritis From 2003 to 2013: A Multinational Analysis Using National Registry Data. Arthritis Care Res (Hoboken). 2017;69(11):1659-67.
7. Culliford DJ, Maskell J, Kiran A, Judge A, Javaid MK, Cooper C, et al. The lifetime risk of total hip and knee arthroplasty: results from the UK general practice research database. Osteoarthritis Cartilage. 2012;20(6):519-24.
8. Engelbert DJ, Weber FA, Jakim I. Long-term results of revision total hip arthroplasty. J Bone Joint Surg Br. 1990;72-B:41-5.
9. Peters CL, Rivero DP, Kull LR, Rosenberg AG. Revision total hip arthroplasty without cement: subsidence of proximally porous-coated femoral components. J Bone Joint Surg Am. 1995;77-A:8.
10. Vinjamuri ARS, Sivanandan MH, Chiranjeevi KP, Sangolgi N, Athipathi S. Functional outcome in total hip arthroplasty. Indian J Orthop Surg. 2021;7(4):312-9.
11. Li F, Zhu L, Geng Y, Wang G. Effect of hip replacement surgery on clinical efficacy, VAS score and Harris hip score in patients with femoral head necrosis. Am J Transl Res. 2021;13(4):3851-5.
12. Meena UK, Sen RK, Behera P, Tripathy SK, Aggrawal S, Rajoli SR. WHOQOL-BREF Hindi questionnaire: quality of life assessment in acetabular fracture patients. Indian J Orthop. 2015;49(3):323-8.
13. Abdulkarim A, Ellanti P, Motterlini N, Fahey T, O'Byrne JM. Cemented versus uncemented fixation in total hip replacement: a systematic review and meta-analysis of randomized controlled trials. Orthop Rev (Pavia). 2013;5(1):e8.

Cite this article as: Vaibhav, Thakur L, Dumpha VK, Singh J, Rajat. Functional outcome, disability and quality of life after primary total hip arthroplasty: a prospective cohort study from North India. Int J Res Orthop 2026;12:1008-11.