



FUNCTIONALITY AMONG PATIENTS AFTER JOINT REPLACEMENT SURGERY

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ABSTRACT

Background: Osteoarthritis is a chronic joint disorder characterized by degenerative changes in articular cartilage and marginal bony overgrowth. The knees and hips are the most commonly affected joints. **Aim:** The aim of the study was to identify the functionality of patients after joint replacement surgery. **Materials and methods:** A quantitative - descriptive design was used. The study was conducted among patients after joint replacement surgery who attended the orthopedic OPD at AIMS Kochi. The sample size was 100 patients after joint replacement surgeries. Validated semi-structured questionnaires, the knee injury and osteoarthritis outcome score (KOOS), and the hip injury and osteoarthritis outcome score (HOOS) were used to collect the data. **Results:** The study results showed that the majorities (66%) of the subjects were females, and 58.7% of the subjects were in the above 60 year old age group. The majority (50.8%) of subjects reported a moderate level of functional status after knee replacement, and 46.8% of subjects showed a good level of functional status after hip replacement surgery. There is no association (p value <0.05) between knee and hip scores and demographic variables. **Conclusion:** The study concludes that the majority of the subjects had a moderate level

of functional status after knee replacement surgery, and the hip subjects had a good level of functional status after hip replacement surgery.

Keywords: Total knee replacement, knee injury and osteoarthritis outcome score (KOOS), hip injury and osteoarthritis outcome score (HOOS)

INTRODUCTION

Osteoarthritis (OA), also known as osteoarthritis or degenerative arthritis, is a common chronic joint disorder characterized by degenerative changes in articular cartilage and marginal bony overgrowth. The knees and hips are the most commonly affected joints. In knees, OA may be caused by localized pain produced by weight-bearing activities, particularly climbing and descending stairs and moving from a sitting to a standing position. About 60% of patients with osteoarthritis of the hip have pain in the region of the greater trochanter that radiates to the anterior, medial or posterior thigh, buttocks, low back, or what is referred to as the knee. Osteoarthritis affects both men and women, but has a higher incidence in women over the age of 55. The prevalence of disease increases with age and is almost universal in individuals over the age of 75. Over the past 20 years, understanding of OA has increased systematically. The estimated cost of OA is \$15.5 billion annually, more than half of which is attributed to sick days from work. The incidence of OA increases with age, but the disease is not caused solely by the aging of articular tissues. Up to the age of 45 years, OA is more common in men; beyond that age, it is more common in women. Although about 50% of older adults have degenerative changes on radiologic examination, only 20% or less have symptoms. ^[1]

Total joint replacement is the treatment of choice (among suitably 'fit' candidates) for end-stage OA. It is a high-cost and high-volume procedure that dominates surgical waiting lists, and this is expected to become critical with the rapidly aging population. The number of hip and knee replacements being performed each year has risen markedly over the past decade in most OECD countries. On average, the rate of hip replacement has increased by over 25%, and the rate of knee replacement has nearly doubled. While joint replacement surgery is mainly carried out in people aged 60 and over, the rate of surgery is also increasing in younger people due to the increasing prevalence of obesity, advances in surgery, and greater patient demand. ^[2]

Any synovial joint in the body can be replaced with a prosthetic system consisting of at least two parts, one for each joint surface. A total joint replacement is the major type of arthroplasty that is performed. Total joint replacement (TKA) is a procedure of last resort for pain management; it is used when all other methods of pain relief have been unsuccessful. Hips and knees are most commonly replaced, but replacements of the finger and wrist joints, elbows, shoulders, and toe joints, and ankles have become more popular in the past 20 years. For clients 65 years of age and older who no longer receive benefit from conservative arthritis management, the procedure of choice is resurfacing of the affected joint with metal or plastic prosthetic components. The goal of TKA is to recreate the motions of flexion, extension, abduction, and rotation that may have been lost with progressive OA joint changes. TKA also relieves pain and corrects joint deformities. The 10-year success rate for the procedure is 98%.^[1]

Total hip arthroplasty involves replacing both the acetabulum and the head and the neck of femur.⁵ Total hip arthroplasty is the most rewarding procedure in orthopedics for patients suffering from advanced degenerative disease of the hip.⁶ The primary indication for total hip arthroplasty was the alleviation of incapacitating pain in patients with osteoarthritis in whom conservative measures had failed. Of secondary importance was the improved function of the hip. The incidence of total hip arthroplasty is 1 in 2, 2661 in the United States. In 2003, there were 200,000 total hip replacements performed, 100,000 partial hip replacements, and 36,000 revision hip replacements.² The purpose of hip hemi arthroplasty, total hip arthroplasty, and hip resurfacing is to improve the biomechanics of the hip joint by replacing the damaged joint with a prosthetic implant, realigning the soft tissues, and eliminating structural and functional deficits.^[3]

The most common risks and complications associated with knee replacement are deep venous thrombosis (DVT), infection, stiffness, loosening, and osteolysis (the softening and loss of bone). DVT is the formation of blood clots in large veins, usually in the legs or pelvis. It is more likely to occur after surgery involving the lower body compared to other surgeries. To prevent DVT, patients are treated with heparin prophylactically and/or given support stockings to wear. Patients are also given antibiotics for 24 hours after surgery to minimize the risk of infection. Stiffness is another associated complication. In most patients, this can be avoided by keeping the knee moving in the days and weeks following surgery.^[4]

The complications associated with THA are skin necrosis requiring drainage and potentially surgery to correct the defect. Persistent joint drainage can occur in the weeks following THA. This complication is often treated with joint aspiration, antibiotics, and, at times, debridement and joint lavage. A wound vacuum may also be used. A large hematoma formation may also be seen. Patients are often advised by the surgeon to rest the hip joint, use ice to help decrease the size of the hematoma, and stop taking anticoagulants. The signs and symptoms include increased joint swelling, pain, and redness in the joint or at the site of the incision. Dislocation: the rates of hip dislocation vary depending on the surgical approach: anterior lateral, 0.70%, lateral, 0.43%, and posterior lateral with soft tissue repair, 1.01%, respectively. Heterotrophic ossification: extra bone growth that can cause stiffness. ^[5]

Commonly expected outcomes for discharge home are the ability to perform bed mobility and functional transfers independently, safely ambulate distances of 50 -100 feet on even and uneven surfaces with an assistive device, and increased knee ROM and strength, as previously identified in the goals outlined above. In a recent community-based prospective study, more than half of the patients (57%) were discharged directly home following TKA, and all patients returned to the community within 6 months post-operatively. ^[5] Most patients who undergo TKR are aged 60-80years, more than 9% of these individuals experience a dramatic reduction in knee pain and a significant improvement in their ability to perform common activities. Poor functional outcomes post-knee replacements are common, but estimates of prevalence vary, likely in part because of differences in methods used to assess the function. Overall, 11.7% (373/3177) of patients reported no clinically important improvement one year after surgery. The number of total knee replacement surgeries more than tripled between 1993 and 2009, and expert says that this is similar to the increased rate of obesity in the US. Experts say that in 2012, in India, 80000 knee replacements took place, compared to 50000 in 2008. The total number of knee replacements performed each year, both total and partial, was 30% from 2004-2008. In that same period, there were 6% increases in these surgeries among men and women between the ages of 45 and 64. OA is a well-known cause of pain and functional disability in the elderly. In patients suffering from severe OA, TKR is the most effective treatment and offers the patient's pain relief and improved physical function (PF). Numerous follow-up studies after TKR have been performed during the last decade, most of which have a follow-up time of 1-2 years. ^[6]

Approximately 66 million people over 65 suffer from OA. TKR is one of the most successful orthopedic surgeries for the treatment of symptomatic knee arthritis. The success rate of surgery is approximately 95- 99%. After the replacement surgery patient can be mobilized as soon as they are out of anesthesia. The patient starts walking, and toilet training is done on the third postoperative day. The chances of complications in TKR are rare, approximately 1%. In AIMS, 4000 successful joint replacement surgeries were done.^[1]

METHODS

Design, Sample and Setting

Quantitative descriptive design was used. The sample size was calculated as 100 patients after joint replacement surgery who were attend orthopedic OPD in AIMS.

Description of tool:

Tool 1: Semi Structured Demographic questionnaires

Demographic questionnaire included questions related to demographic characteristics including age, sex, marital status, educational level, occupation, and also including clinical data of duration of surgery.

Tool 2: Knee Injury and Osteoarthritis Outcome Score (KOOS)

The KOOS five patients relevant dimensions are scored separately: pain (9 items): symptoms (7 items): ADL function (17 items): sports and recreation functions (5 items): quality of life 9(4 items).

Tool 3: Hip Injury and Osteo Arthritis Outcome Score (HOOS)

The HOOS 5 patients relevant dimensions are scored separately: symptoms (5 items) stiffness (2 items): pain (10 items): ADL functions (17 items): sports and recreation functions (4 items): quality of life (4 items).

Reliability: Reliability coefficient of the KOOS tool was 0.90, and HOOS tool was 0.96

Data Collection Procedure

Obtained ethical clearance from the institutional theses review committee and head of the department for conducting study. Screened the sample as per the inclusion criteria by using convenience sampling technique and rapport established with sample and purpose of the study explained to them after that informed consent obtained from the sample. The demographic data collected from the subjects. The data regarding functionality among patients after joint replacement surgery obtained using KOOS and HOOS. Duration of the data collection was 10 minutes.

Results:

Section1: Distribution of Subjects according to Demographic and Clinical Data

Tab 1: Socio demographic and clinical data of subjects (hip and knee)

n=100

Socio demographic variables	Frequency	Percentage (%)
1.Sex		
Male	34	34
Female	66	66
2.Marital status		
Married	95	95
Unmarried	4	4
Widow	1	1
3.Education		
Illiterate	2	2
5 th	16	16
10 th	54	54
Plus two	18	18
Graduate/above	10	10
4.Occupation		
Employee	32	32
Unemployed	50	50
Retired	18	18
5.Duration of surgery		
1year	68	68
2year	12	12
>2year	20	20

Table: 1 depicts 2/3rd of the subjects i.e., 100 (43.2%) belongs to age group of 51-60 years. Most of the subjects (66%) belong to females. About (95%) subjects got married. 54% subjects are education status of 10th class and only 2% are illiterate. About 50% subjects are unemployed and 32% are employed. Majority (68%) of subjects belongs to the first year of life after surgery.

Section 2: Distribution of knee score according to functionality

n=100

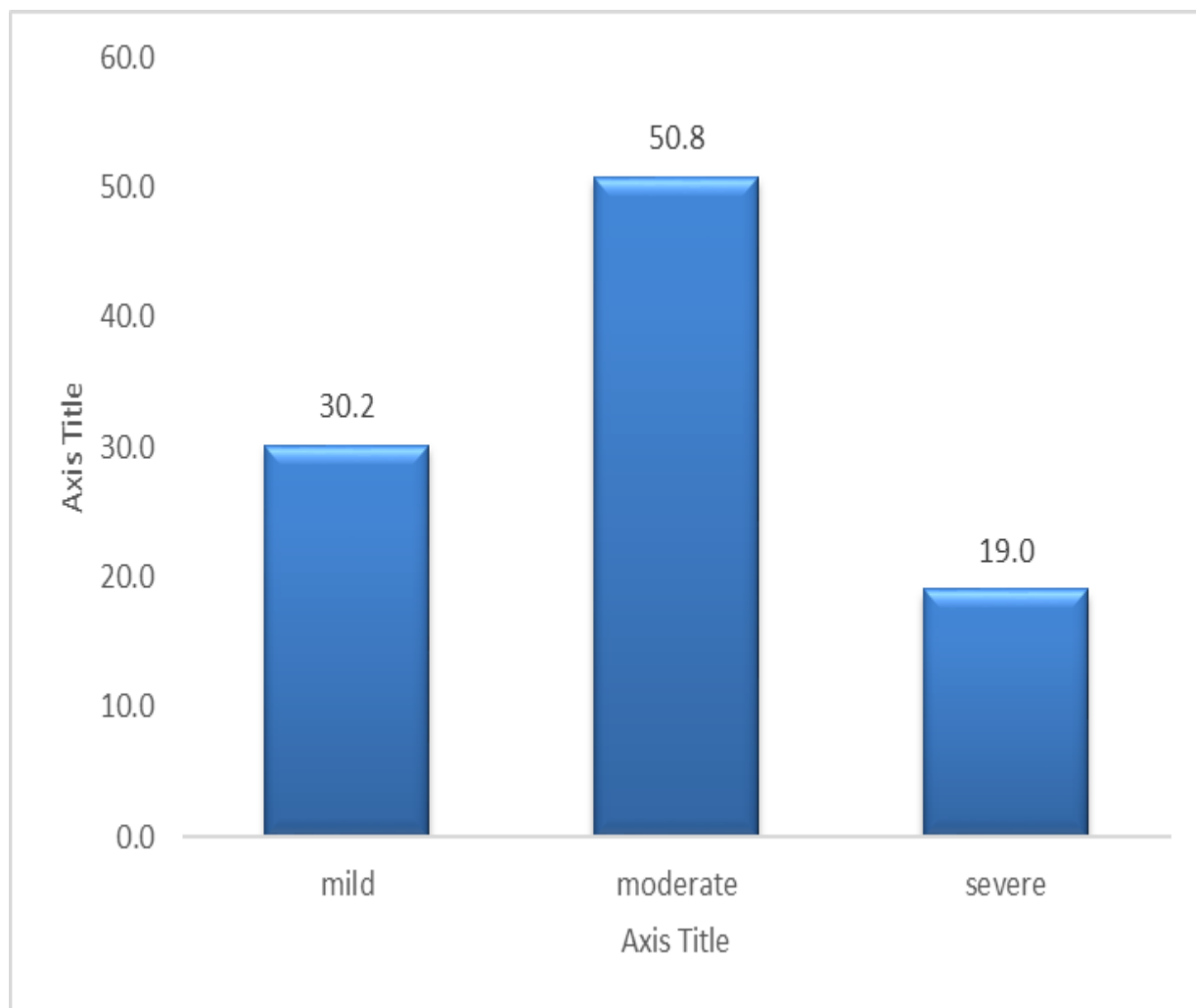


Fig 2: Depicts that totally 63 patients in that 50.8% of patients improved by moderate level of functional status, 30.2% had only mild level of functional status. Only 19% of patient had good level of functionality.

Section3: Distribution of hip score according to functionality

n=100

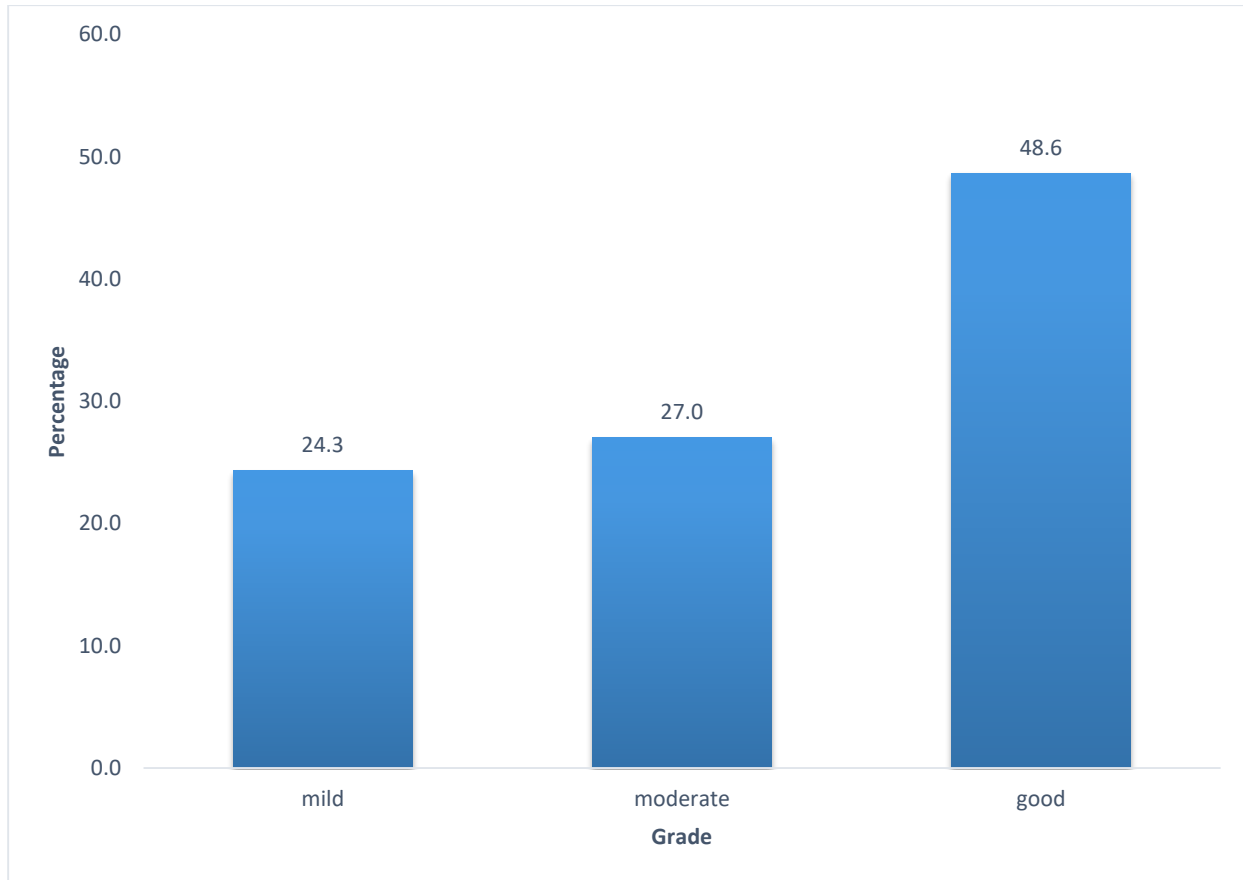


Fig 3: Depicts that totally 37 patients in that 48.6% patients achieved good functional status after THR.27% patients achieved moderate level of functional status and only 24.3 patients had mild level of functional status.

Section 4:Table2: Association Between Hip Score and Socio Demographic Variables

n=100

Factors	Category	Hip score						P value
		Mild		Moderate		Severe		
		n	%	N	%	N	%	
Sex	M(19)	7	36.8	4	21.1	8	42.1	0.185
	F (18)							
Age	<50(8)	3	37.5	0	0.0	5	62.5	0.143
	>50(29)	6	20.7	10	34.5	13	44.8	
Marital status	Married(32)	8	25.0	9	28.1	15	46.9	0.355
	Unmarried(4)	1	25.0	0	0.0	3	75.0	
	Widow (1)	0	0.0	1	100.0	0	0.0	
Education	Illiterate(2)	2	100.0	0	0.0	0	0.0	0.144
	5 th and 10 th (23)	4	74.4	7	30.4	12	52.2	
	Plus two and above(12)	3	25.0	3	25.0	6	50.0	
Occupation	Employ(15)	6	40.0	3	20.0	6	40.0	0.205
	Unemployed(21)	3	14.3	6	28.6	12	57.1	
	Retired (1)	0	0.0	1	100.0	0	0.0	

Table3: showing p value is <0.05 so there is no association between hip score and demographic variables.

Section 5: Table 3: Association between knee score and demographic variables

n=100

Factors	Category	Hip score						P value
		Mild		Moderate		Severe		
		n	%	n	%	n	%	
Sex	M(15)	3	20.0	10	66.7	2	13.3	1.988
	F (48)	16	33.3	22	45.8	10	20.8	
Age	<50(7)	3	42.9	3	42.9	1	14.3	0.612
	>50(56)	16	28.6	29	51.8	11	19.6	
Education	5 th and 10 th (47)	14	29.8	25	53.2	8	17	0.617
	Plus two and above(16)	5	31.3	7	43.8	4	25	
Occupation	Employed(17)	3	17.6	12	70.6	2	11.8	11.279
	Unemployed(29)	6	20.7	15	51.7	8	27.6	
	Retired (17)							

Table 3: Showing p value is <0.05 so statistically there is no association between knee score and demographic variables.

DISCUSSION

This section deals with the discussion of the study findings in light of the available literature. The current study was conducted to assess the functionality of patients after joint replacement surgery at AIMS, Kochi.

The study was designed with the following objectives:

1. Identify the functionality of the patient after hip replacement surgery.
2. Identify the functionality among patients after knee replacement surgery.
3. Find an association between functionality and selected variables.

The strength of our study is that it assessed the outcomes in a manner that included demanding activities and expectations concerning such activities by using KOOS as outcome measurement. It is also clear that these questions are relevant for the patients. It is notable that even in this elderly population, questions concerning sport and recreational function were relevant for more than half of the patients.

The discussion is organized under the following headings:

1. Functional status of patients after joint replacement surgery
2. Association between functionality and selected variables

The first objective was to identify the functionality among patients after joint replacement surgery (hip and knee).

In the current study, the majority (50.8%) of the subjects reported a moderate level of functional status after knee replacements, and 46.8% of the subjects' showed a good level of functional status after hip replacement surgery. Only 19% of subjects had a good level of functional status after knee replacement (Figures 2 and 3).

Michael Stanger,MD, Christine Morrison,PT, Erdem Yazganoglu,MD, and Munject (mergi) Bhalla conducted a prospective study in 2010 in India to assess patient-reported outcome measures and to investigate the practicality of using PROMS in a surgical office at a nonacademic center by questionnaire method. They found that 80.55% of hip patients and 68.9% of knee patients achieved this minimum clinically important difference by 12 months. They also found significant improvement when comparing the 3-6-month results with the 12-month results for hips (61.7% vs. 80.5%) and knees (54.0% vs. 68.9%). This supports using a 12-month follow-up interval for joint replacement assessments.

A K Nils dotter, S.Tokvig –Larson and E.M.Roos conducted a prospective study in 2009 to describe self-reported outcomes up to five years after TKR in OA and to study which patient-relevant factors may predict outcomes for pain and physical function by using KOOS scoring in 125 patients in Lund University Hospital. In that study, they found that 88% of the patients improved more than 10 score units at the 5 to 6-year follow-up concerning pain and 81% concerning improvement from surgery.

The second objective was to find the association between functionality and selected variables.

In the current study, the p value is >0.05 , so there is no association between functionality and sociodemographic variables.

Conclusion:

This study concluded with the result that the majority of the subjects achieved a moderate level of functional status after knee replacement surgery and a good level of functional status after hip replacement surgery. Early interventions for patients undergoing total joint replacement surgery for osteoarthritis will have good functional status.

Conflict of Interest

Nil

Source of Funding

Self

Ethical Consideration

Permission had been taken from the research committee of Amrita College of Nursing and Thesis Review Committee of AIMS, Kochi. Consent was obtained from the subjects.

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