# From Disability to Arthroplasty: Prevalence of Osteoarthritis and Utilization of Joint Replacement in Pakistan's Elderly Population.

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**Abstract**

**Background:**Osteoarthritis is one of the most common degenerative joint diseases in elderly people and contributes to a significant proportion of chronic pain, disability, and diminished mobility in Pakistan. At the advanced stage, the condition may need surgical intervention, such as joint replacement, to regain function and quality of life.

**Objectives:**To assess the prevalence of OA in the elderly Pakistani population and the outcome of JRS in terms of pain relief, mobility improvement, complications, and satisfaction of patients.

**Methodology:**The was a cross-sectional study and was carried out in the Department of Orthopedic MTI lady reading hospital Peshawar from 25 April 2019 to 25 October 2022. Patients older than 60 years who were diagnosed as having advanced osteoarthritis and were to undergo total knee replacement (TKA) or total hip replacement (THA) were recruited by consecutive sampling for a total of 100 patients. The following data were collected: demographic parameters, involved joints, co-morbidities, pain, postoperative mobility, and complications. The statistical analysis was carried out using SPSS version 20, and a p-value < 0.05 was used as significant.

**Results:**The 100 patients, 68% were females and 32% were males, with a mean age of 66.8 ± 5.9 years. Knee osteoarthritis was present in 78% of cases, while hip osteoarthritis accounted for 22%. Total knee replacement was performed in 74% of patients and total hip replacement in 26%. Mean pain scores significantly improved from 8.1 ± 1.2 preoperatively to 2.4 ± 0.9 postoperatively (p=0.001). Functional mobility improved in 84% of patients. Postoperative complications occurred in 11% of cases, including wound infection, joint stiffness, and deep vein thrombosis. Female patients showed significantly higher osteoarthritis prevalence (p=0.032).

**Conclusion:**Osteoarthritis is very common in older adults in Pakistan, especially females, and THR surgery can significantly reduce the pain and increase mobility, while also having relatively low complication rates.

**Keywords :** Osteoarthritis, Joint Replacement, Elderly, Arthroplasty

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## Introduction

Osteoarthritis (OA) is the most common degenerative joint disease and a leading cause of chronic disability among the elderly population worldwide. It is a progressive disease that involves damage to the articular cartilage, narrowing of the joint space, growth of bone spurs, bone sclerosis of the subchondral bone, and inflammation of the synovial lining, leading to pain, stiffness, deformity, and loss of movement. Osteoarthritis is now a major problem due to the rise in life expectancy, ageing population, obesity, lack of exercise, metabolic disorders, etc., over the past few decades. The elderly are especially susceptible, as aging is known to lead to structural and biochemical changes in joint cartilage and tissues [1,2]. Osteoarthritis is a large burden of disease and socio-economic issue that impacts millions of people around the world. The two most frequently affected weight-bearing joints are the knee and the hip joint, causing a lot of disability and impacting the quality of life. Epidemiological studies in other parts of the world estimate about 10-15% of adults older than 60 years to have symptomatic osteoarthritis, with an increased prevalence in females than males. Osteoarthritis, apart from being a physical disability, is a psychological stress, social dependency, and economic burden as a result of the long-term treatment and rehabilitation needs [3,4]. Osteoarthritis has become a significant public health problem in Pakistan for senior citizens. Urbanisation, high prevalence of obesity, low levels of physical activity, nutritional deficiencies, and lack of awareness of early disease management have been responsible for the increase in the prevalence of osteoarthritis in the Pakistani population. The cultural and occupational habits of repeated squatting, stair climbing, prolonged standing, and heavy labor are significant factors in the development of knee osteoarthritis. In Pakistan, elderly women suffer from age-related hormonal changes, obesity, and poor access to health care facilities [5,6]. Clinically, the symptoms of OAE are increased pain with motion, morning stiffness, swelling, crepitus, loss of range of motion, and progressive functional impairment. As the disease progresses, patients can end up needing the help of family members to complete daily tasks, which can have a significant impact on their daily life and independence. The diagnosis relies on the clinical examination and the radiological examination (joint space narrowing, osteophytes, and deformity on the X-rays). The severity of the disease is assessed using various grading systems, especially the Kellgren–Lawrence grading system [7,8]. Treatment for osteoarthritis starts with conservative options like weight loss, physiotherapy, exercise, analgesics, non-steroidal anti-inflammatory drugs (NSAIDs), intra-articular injection of a corticosteroid, or lifestyle modification. Conservative management can sometimes help alleviate symptoms of early disease, but advanced osteoarthritis can still worsen. Many patients who have severe pain, deformity, and disability may need surgery [9]. Joint replacement surgery is the treatment of choice for end-stage osteoarthritis. Several effective treatments can relieve pain, improve function, and improve mobility and quality of life for people, including total knee replacement (TKR) and total hip replacement (THR). The surgical skills, materials, peri- and post-operative management, and rehabilitation protocols have all made significant strides in improving the outcomes of surgery and survival of prostheses. Over the years, arthroplasty has experienced a progressive rise in Pakistan, with the introduction of better

healthcare facilities, increasing awareness, and more patient acceptance of the surgical treatment [10].Although joint replacement surgery is becoming more prevalent in Pakistan, few local data exist on the incidence of OA and the outcomes of arthroplasty in the elderly population. Furthermore, several factors remain to influence patient outcome after surgery, including delayed presentation, limited rehabilitation services, financial constraints, and postoperative complications. Hence, the present study was designed to find out the incidence of OA and to assess the results of the surgical treatment in the form of joint replacement surgery in the elderly population of Pakistan.

## Study Objectives

To determine the prevalence rate of OA in elderly patients of Pakistan and to see the clinical outcomes, postoperative mobility, pain relief, and complications of joint replacement surgery.

## Materials and Methods

## Study Design & Setting

The cross-sectional descriptive study was carried out in the Department of Orthopedic MTI lady reading hospital Peshawar from 25 April 2019 to 25 October 2022.

## Participants

The total number of patients included was 100 elderly patients diagnosed with advanced osteoarthritis of the knee, who were sampled using a non-probability consecutive sampling method. Patients older than age 60 who had a total knee replacement (TKA) or total hip replacement (THR) were enrolled. All the participants gave informed consent, and a structured data collection proforma was used to document demographic information, clinical history, radiological findings, comorbidities, and postoperative outcomes.

## Sample Size Calculation

A sample size of 100 patients was estimated by the WHO sample size formula, given a 50% prevalence of osteoarthritis in patients > 60 years, a 5% margin of error, and a 95% confidence interval. The number of patients included in the calculated sample size was sufficient to assess the prevalence and surgical outcomes of patients receiving joint replacement surgery.

## Inclusion Criteria

- Patients aged ≥60 years
- Osteoarthritis is diagnosed clinically and with X-rays, and is confirmed to be advanced.
- Patients who are scheduled for total knee replacement (TKR) or total hip replacement (THR)
- Both men and women patients
- • Patients who consent to follow-up care and diagnosis. • Patients who are willing to follow up for diagnosis and treatment.

Exclusion Criteria

- Patients who have rheumatoid arthritis or inflammatory joint diseases.
- Information on past surgeries of the joint.
- Patients who have an active joint infection or malignancy.
- People who are not medically suitable for surgery.
- Patients who refuse to take part in the study

## Diagnostic and Management Strategy

Osteoarthritis was diagnosed based on clinical examination and radiography, based on the Kellgren–Lawrence grade. Patients with advanced disease were offered total knee replacement or hip replacement surgery to be followed by a standard post-operative rehabilitation, physiotherapy, pain management, and routine follow-up to assess recovery and complications.

## Statistical Analysis

The data were analysed using SPSS 20. The data obtained on quantitative variables, such as age and pain scores, were presented as mean ± standard deviation, while qualitative variables were presented as frequencies and percentages. Associations and treatment outcomes were established by the use of the chi-square test and the paired t-test, respectively. The p-value <0.05 was define

## Results

A total of 100 elderly patients with advanced osteoarthritis were included in the study. Among them, 68 (68%) were females and 32 (32%) were males. The mean age of participants was 66.8 ± 5.9 years, ranging from 60 to 82 years. Knee osteoarthritis was identified in 78% of patients, whereas hip osteoarthritis was observed in 22% of cases. Obesity was the most common associated comorbidity, present in 46% of patients, followed by hypertension in 39% and diabetes mellitus in 28%. Regarding surgical procedures, total knee replacement was performed in 74 patients while total hip replacement was carried out in 26 patients. Preoperative pain assessment demonstrated a mean pain score of 8.1 ± 1.2, which significantly improved to 2.4 ± 0.9 postoperatively (p=0.001). Functional mobility improved substantially in 84% of patients following rehabilitation and physiotherapy. Female patients demonstrated a significantly higher prevalence of osteoarthritis compared to males (p=0.032). Postoperative complications were reported in 11% of patients. Superficial wound infection occurred in 4%, joint stiffness in 3%, deep vein thrombosis in 2%, and prosthetic loosening in 2% of patients. Most complications were managed successfully without requiring revision surgery. Ed as statistically significant.

Table 1: Demographic Characteristics of Study Participants (n=100)

| Variable | Frequency (n) | Percentage (%) |
|---|---|---|

| | | |
|---|---|---|
| **Gender** | | |
| Male | 32 | 32% |
| Female | 68 | 68% |
| **Age Group (Years)** | | |
| 60–65 | 42 | 42% |
| 66–70 | 34 | 34% |
| 71–75 | 16 | 16% |
| >75 | 8 | 8% |
| **Mean Age ± SD** | 66.8 ± 5.9 years | — |

Table 1 shows the demographic distribution of elderly patients with osteoarthritis included in the study. Female patients constituted the majority, and the mean age of participants was 66.8 ± 5.9 years.

**Table 2: Distribution of Osteoarthritis and Surgical Procedures (n=100)**

| Variable | Frequency (n) | Percentage (%) |
|---|---|---|
| **Affected Joint** | | |
| Knee Osteoarthritis | 78 | 78% |
| Hip Osteoarthritis | 22 | 22% |
| **Surgical Procedure** | | |
| Total Knee Replacement | 74 | 74% |
| Total Hip Replacement | 26 | 26% |

Table 2 demonstrates the prevalence of affected joints and the type of joint replacement surgeries performed among elderly osteoarthritis patients. Knee osteoarthritis and total knee replacement were the most common findings.

**Table 3: Comorbidities Among Study Participants (n=100)**

| Comorbidity | Frequency (n) | Percentage (%) |
|---|---|---|
| Obesity | 46 | 46% |
| Hypertension | 39 | 39% |
| Diabetes Mellitus | 28 | 28% |
| Cardiovascular Disease | 14 | 14% |

| | | |
|---|---|---|
| Chronic Kidney Disease | 6 | 6% |

Table 3 illustrates the associated comorbid conditions observed among elderly patients with osteoarthritis. Obesity and hypertension were the most frequently identified risk factors.

Table 4: Postoperative Outcomes and Complications (n=100)

| Variable | Value |
|---|---|
| Mean Preoperative Pain Score ± SD | 8.1 ± 1.2 |
| Mean Postoperative Pain Score ± SD | 2.4 ± 0.9 |
| Improvement in Functional Mobility | 84% |
| p-value | 0.001 |
| **Postoperative Complications** | |
| Superficial Wound Infection | 4% |
| Joint Stiffness | 3% |
| Deep Vein Thrombosis | 2% |
| Prosthetic Loosening | 2% |

Table 4 summarizes postoperative outcomes following joint replacement surgery. Significant reduction in pain scores and improvement in functional mobility were observed, while postoperative complications remained low and manageable.

## Discussion

The term arthritis refers to the pain and inflammation of the bones, which is one of the most common forms of disabilities in older people worldwide and an increasing health care challenge in developing countries such as Pakistan. In the present study, it was found that a significant number of elderly patients in Pakistan suffered from OA, more so in females than males. The most common disease was identified as being knee osteoarthritis, with total knee replacement being the most common surgical procedure performed. The results of this study are in line with the recent regional and international studies carried out in the past 5 years [11,12]. The present study revealed that females were 68% of the study population, suggesting that the burden of osteoarthritis was significantly higher in females. The results were similar to those of recent South Asian studies, where the prevalence of osteoarthritis was found to be higher in post-menopausal women due to the impact of hormonal changes, obesity, lower bone density, and muscle weakness [13]. A multi-center study in Pakistan undertaken in 2021 has also recorded the higher prevalence of females in knee OA, with women constituting almost 2/3 of cases, who had to undergo arthroplasty procedures [14]. This gender disparity may also be attributed to cultural factors affecting healthcare access, limited physical activity, and vitamin D deficiency.The mean age of patients in our study

(66.8 ± 5.9 years) is similar to that reported in the recent international literature. The mean age in the patients undergoing a joint replacement surgery for advanced osteoarthritis in recent studies from India, China, and the Middle East ranges from 64 to 69 years [15]. There are several factors that make older people more likely to develop osteoarthritis, including age-related cartilage breakdown, chronic inflammatory changes, and decreased regenerative capacity [16]. In total, 78% of the patients had knee arthritis, and 22% had hip arthritis. This high prevalence of knee involvement has been consistently reported from the Pakistani and Asian population [13–15]. Mechanical stress on the knee joint, such as frequent climbing up and down stairs, prolonged squatting, sitting on the floor, and heavy work, can contribute to mechanical stresses that lead to the degeneration of the knee. In another study in 2020 at Lahore, knee OA was also found to be the most common reason for arthroplasty in elderly patients [17]. Surgical management (total knee replacement) was more common than total hip replacement in this study. The same has been observed worldwide, and total knee arthroplasty is still the most common surgical procedure for end-stage osteoarthritis, due to the higher incidence of knee disease [18]. Our study showed that there was a notable decrease in pain scores after surgery from 8.1 ± 1.2 to 2.4 ± 0.9, highlighting the effectiveness of joint replacement to provide pain relief and enhance patient outcomes. Recent outcome studies in the elderly have shown comparable results for arthroplasty for pain and mobility [19]. There was a significant improvement in functional mobility after surgery and rehabilitation in 84% of patients. This has been confirmed by recent literature in orthopedics that structured physio and rehab interventions are important to restore mobility and enhance quality of life post arthroplasty. Elderly patients are known to have significant improvements in daily functioning, independence, and psychological function following successful total joint replacement surgery from various developed and developing countries' studies [20].There were relatively few complications associated with the surgery in the present study, with 11% experiencing complications after surgery. Common complications found were superficial wound infection and joint stiffness. The same level of complication rate was seen in recent arthroplasty studies with an infection rate of between 2% and 5% and relatively few thromboembolic events with proper prophylaxis [19,20]. Significant improvements in surgical techniques, infection control, perioperative antibiotic use, and postoperative rehabilitation have helped to enhance the outcomes of surgery and minimize complications.

## Limitations

The present study had several limitations, such as the single-center design, a small number of patients, and a short follow-up period. There was a lack of ability to fully assess long-term functional outcome and survival of the prostheses, and to assess the quality of life. Further, this study may not be representative of the general population of elderly Pakistani patients suffering from osteoarthritis due to the use of non-probability sampling.

## Conclusion

Osteoarthritis is very common in older citizens of Pakistan, especially women, and the most common site is the knee. The improvements in pain and function that result from joint replacement surgery are dramatic, and the rate of complications is acceptable. Early diagnosis, adequate surgical intervention, and rehabilitation are crucial to minimize disability and enhance the quality of life for affected patients.

Disclaimer: Nil

**Conflict of Interest:** Nil

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**Authors Contributions**

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Final Approval of version: **All Mentioned Authors Approved.**

**Reference**

1. Talmo CT, Robbins CE, Bono JV. Total joint replacement in the elderly patient. Clin Geriatr Med. 2010 Aug;26(3):517-29. doi: 10.1016/j.cger.2010.04.002.
2. Simpson-White RW, Chojnowski AJ. Pyro carbon metacarpophalangeal joint replacement in primary osteoarthritis. J Hand Surg Eury Vol. 2014 Jul;39(6):575-81. doi: 10.1177/1753193413511946.
3. Wallis JA, Taylor NF. Pre-operative interventions (non-surgical and non-pharmacological) for patients with hip or knee osteoarthritis awaiting joint replacement surgery--a systematic review and meta-analysis. Osteoarthritis Cartilage. 2011 Dec;19(12):1381-95. doi: 10.1016/j.joca.2011.09.001.
4. Sweets TM, Stern PJ. Pyrolytic carbon resurfacing arthroplasty for osteoarthritis of the proximal interphalangeal joint of the finger. J Bone Joint Surg Am. 2011 Aug 3;93(15):1417-25. doi: 10.2106/JBJS.J.00832.
5. Jennings CD, Livingstone DP. Surface replacement arthroplasty of the proximal interphalangeal joint using the SR PIP implant: long-term results. J Hand Surg Am. 2015 Mar;40(3):469-473.e6. doi: 10.1016/j.jhsa.2014.11.015.
6. Vitale MA, Fruth KM, Rizzo M, Moran SL, Kakar S. Prosthetic Arthroplasty Versus Arthrodesis for Osteoarthritis and Posttraumatic Arthritis of the Index Finger Proximal Interphalangeal Joint. J Hand Surg Am. 2015 Oct;40(10):1937-48. doi: 10.1016/j.jhsa.2015.05.021.

7. Frankel L, Sanmartin C, Conner-Spady B, Marshall DA, Freeman-Collins L, Wall A, Hawker GA. Osteoarthritis patients' perceptions of "appropriateness" for total joint replacement surgery. Osteoarthritis Cartilage. 2012 Sep;20(9):967-73. doi: 10.1016/j.joca.2012.05.008.
8. Reininga IH, Stevens M, Wagonmakers R, Bulsara SK, van den Akker-Schiek I. Minimally invasive total hip and knee arthroplasty-implications for the elderly patient. Clin Geriatr Med. 2012 Aug;28(3):447-58. doi: 10.1016/j.cger.2012.05.009.
9. Staiano P, Winemaker M, Petruccelli D, de Beer J. Total joint arthroplasty and preoperative low back pain. J Arthroplasty. 2014 May;29(5):867-71. doi: 10.1016/j.arth.2013.10.001.
10. Talmo CT, Aghazadeh M, Bono JV. Perioperative complications following total joint replacement. Clin Geriatr Med. 2012 Aug;28(3):471-87. doi: 10.1016/j.cger.2012.05.006.
11. Papatheodorou LK, Baratz ME, Satrianos DG. Elbow arthritis: current concepts. J Hand Surg Am. 2013 Mar;38(3):605-13. doi: 10.1016/j.jhsa.2012.12.037.
12. Hochberg MC. Opportunities for the prevention of osteoarthritis. Semin Arthritis Rheum. 2010 Apr;39(5):321-2. doi: 10.1016/j.semarthrit.2010.02.001.
13. Allen B, Schoch B, Sperling JW, Cofield RH. Shoulder arthroplasty for osteoarthritis secondary to glenoid dysplasia: an update. J Shoulder Elbow Surg. 2014 Feb;23(2):214-20. doi: 10.1016/j.jse.2013.05.012.
14. Mnatsakanian G, Davidson DC, Hiller JE, Ryan P. Propensity score matching and randomization. J Clin Epidemiol. 2015 Jul;68(7):760-8. doi: 10.1016/j.jclinepi.2015.01.002.
15. Herath SC, Holstein JH, Pisanis A, Pohlmann T. Azetabulumfrakturen: Complication und Endoprosthesis [Fractures of the acetabulum: complications and joint replacement]. Z Ortho Onfall. 2014 Aug;152(4):399-413. German. doi: 10.1055/s-0034-1382862.
16. Leunig M, Ganz R. Editorial comment: 2014 International Hip Society proceedings. Clin Ortho Relate Res. 2015 Dec;473(12):3714-5. doi: 10.1007/s11999-015-4580-7.
17. Collins M, Lavigne M, Girard J, Venditti PA. Joint perception after hip or knee replacement surgery. Ortho Tramadol Surg Res. 2012 May;98(3):275-80. doi: 10.1016/j.otsr.2011.08.021.
18. Parks ML, Hebert-Beirne J, Rojas M, Tuzzio L, Nelson CL, Boutin-Foster C. A qualitative study of factors underlying decision making for joint replacement among African Americans and Latinos with osteoarthritis. J Long Term Eff Med Implants. 2014;24(2-3):205-12. doi: 10.1615/jlongtermeffmedimplants.2014010428.
19. Fink B, Schwenn Inger C. Patellofemoral Ersatz - Welch Dateline Haben war? [Arthroplasty of the Femoropatellar Joint - What Data are Available?]. Z Ortho Onfall. 2014 Apr;152(2):182-7. German. doi: 10.1055/s-0033-1360353.
20. Amendola L, Fosco M, Ceni E, Tigani D. Knee joint arthroplasty after tibial osteotomy. Int Ortho. 2010 Feb;34(2):289-95. doi: 10.1007/s00264-009-0894-y.