

Assessment of Patient Reported Outcomes and Satisfaction following various Orthopedic Procedures, Such as Joint Replacements, Spinal Surgeries, or Fracture Management

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Abstract:

Objective: This study aimed to assess patient-reported outcomes (PROs) and satisfaction following orthopedic procedures, including joint replacements, spinal surgeries, and fracture management.

Methods: A total of 208 participants who underwent orthopedic procedures were included. Demographic and clinical characteristics were collected and analyzed using descriptive statistics. PROs were evaluated using validated outcome measures specific to each procedure, including the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and the Short Form Health Survey (SF-36). Patient satisfaction ratings were collected using a structured survey. Subgroup analyses and regression analyses were conducted to explore associations between PROs, patient satisfaction, and demographic/clinical factors.

Results: The study population had a mean age of 52.3 years, with a relatively balanced gender distribution. Joint replacements were performed in 45.2% of participants, followed by spinal surgeries (32.7%) and fracture management (22.1%). Participants reported significant improvements in PROs following joint replacements, with higher WOMAC and SF-36 scores indicating reduced pain, improved physical function, and better health-related quality of life. Spinal surgery patients demonstrated reduced disability and improved well-being as reflected in lower Oswestry Disability Index (ODI) scores and higher SF-36 scores. Fracture management patients showed improved functionality and quality of life, with higher SF-36 scores and lower Disability of Arm, Shoulder, and Hand (DASH) or Lower Extremity Functional Scale (LEFS) scores. Patient satisfaction ratings were high for all procedures, with joint replacement patients reporting high satisfaction with pain relief and functional improvement, spinal surgery patients reporting high satisfaction with pain management and overall treatment, and fracture management patients expressing high satisfaction with pain management and functional recovery. Subgroup analyses revealed significant differences in PRO scores and patient satisfaction ratings across the procedures, with joint replacements consistently demonstrating the highest scores.

Conclusion: Orthopedic procedures, including joint replacements, spinal surgeries, and fracture management, result in significant improvements in PROs and high levels of patient satisfaction. These findings emphasize the effectiveness of these interventions in addressing pain, functional limitations, and overall well-being in patients undergoing orthopedic procedures.

Keywords: Orthopedic Procedures, Patient-Reported Outcomes, Satisfaction, Joint Replacements, Spinal Surgeries, Fracture Management.

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Introduction

Orthopedic procedures, including joint replacements, spinal surgeries, and fracture management, are commonly performed to improve musculoskeletal health and alleviate pain and functional limitations. With an aging population and an increase in the prevalence of musculoskeletal disorders, the demand for these procedures has grown significantly in recent years. While the primary goals of orthopedic procedures are to restore function, reduce pain, and improve quality of life, it is equally important to assess

patient-reported outcomes (PROs) and satisfaction to evaluate the ef-

fectiveness of these interventions[1,2]. PROs provide valuable insights into patients' perceptions of their health status and treatment outcomes, incorporating their perspectives on pain, physical function, psychological well-being, and social aspects of life. By measuring PROs, clinicians and researchers can gain a comprehensive understanding of the impact of orthopedic procedures on patients' lives and tailor treatment plans accordingly. Additionally, assessing patient

satisfaction allows healthcare providers to gauge patients' overall experiences with their care and identify areas for improvement. Joint replacements, such as total hip arthroplasty (THA) and total knee arthroplasty (TKA), are among the most commonly performed orthopedic procedures [3-7]. These procedures have demonstrated remarkable success in relieving pain, improving joint function, and restoring mobility for patients with end-stage osteoarthritis or other degenerative joint diseases. However, the evaluation of PROs, including pain relief, functional improvement, and patient satisfaction, is crucial to fully understand the long-term benefits and limitations of joint replacements. Similarly, spinal surgeries, including decompression procedures and spinal fusion, aim to alleviate pain, correct spinal deformities, and improve overall spinal stability and function. While these procedures have shown promising outcomes in terms of pain reduction and functional improvement, PROs and patient satisfaction data are necessary to assess the long-term impact of spinal surgeries on patients' quality of life.

Understanding the factors that contribute to patient satisfaction and successful outcomes in spinal surgery is essential for optimizing patient care and treatment planning. Fracture management, encompassing surgical and non-surgical interventions, plays a vital role in restoring function and facilitating the healing process for individuals with fractures. Whether it is internal fixation, external fixation, or conservative management, the patient's perspective on pain, physical function, and overall well-being is crucial for evaluating treatment success[8]. Assessing PROs and patient satisfaction following fracture management procedures can aid in identifying areas for improvement in fracture care protocols and optimizing patient outcomes. To assess PROs and patient satisfaction, validated outcome measures and questionnaires are commonly used in clinical practice and research. These tools capture important domains such as pain intensity, physical function, mental health, and health-related quality of life. Examples of widely used PRO measures include the Short Form Health Survey (SF-36), the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), and the Oswestry Disability Index (ODI). These instruments provide standardized and reliable assessments of patients' health status and treatment outcomes, enabling comparisons across different populations and interventions. In addition to PROs, patient satisfaction surveys are valuable tools for evaluating the quality of care and identifying areas for improvement[9-11].

These surveys often include questions related to patients' experiences with healthcare providers, communication, pain management, and overall

satisfaction with the treatment received. By analyzing patient satisfaction data, healthcare organizations can identify gaps in service delivery, implement targeted interventions, and enhance patient-centered care [12]. The aim of this study is to assess PROs and patient satisfaction following various orthopedic procedures, including joint replacements, spinal surgeries, and fracture management. By investigating these outcomes, we aim to enhance our understanding of the effectiveness of these interventions in improving patients' well-being and quality of life. Furthermore, this research can help identify factors that influence patient satisfaction, allowing for the development of strategies to optimize patient care and enhance treatment outcomes.

Materials and Methods

Study Design

This study utilized a prospective observational design to assess patient-reported outcomes (PROs) and satisfaction following orthopedic procedures, including joint replacements, spinal surgeries, and fracture management.

Participants

A total of 208 participants who underwent orthopedic procedures were included in this study. Eligible participants were adults aged 18 years or older who underwent joint replacements (e.g., total hip arthroplasty, total knee arthroplasty), spinal surgeries (e.g., decompression procedures, spinal fusion), or fracture management (e.g., internal fixation, external fixation, conservative management). Patients with cognitive impairments or communication barriers were excluded from the study.

Sample Size Calculation

The sample size of 208 was determined based on a power analysis to detect significant differences in PROs and satisfaction scores. Considering an estimated effect size, a desired power level, and a significance level of 0.05, the sample size calculation indicated that a minimum of 208 participants would be required to achieve adequate statistical power.

Data Collection

Data collection occurred at multiple time points, including preoperative, postoperative (at specified intervals), and follow-up visits. Demographic and clinical data, such as age, gender, type of procedure, and relevant medical history, were collected from participants' medical records.

PRO Measures

PROs were assessed using validated outcome measures and questionnaires tailored to the specific

orthopedic procedures. For joint replacements, the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and the Short Form Health Survey (SF-36) were used to evaluate pain, physical function, and health-related quality of life. Spinal surgery patients were assessed using the Oswestry Disability Index (ODI) and the SF-36 to measure disability and overall well-being. Fracture management patients completed the SF-36 and a fracture-specific PRO measure, such as the Disability of Arm, Shoulder, and Hand (DASH) questionnaire or the Lower Extremity Functional Scale (LEFS). Trained research personnel administered the PRO measures through in-person interviews or electronic platforms.

Patient Satisfaction Survey

A structured survey developed specifically for this study was used to assess patient satisfaction. The survey included questions related to patients' experiences with healthcare providers, communication, pain management, and overall satisfaction with the treatment received. The survey was administered at the follow-up visit or sent to patients for completion.

Data Analysis

Descriptive statistics were used to summarize the demographic and clinical characteristics of the

study population. PRO scores and patient satisfaction ratings were analyzed using appropriate statis

tical methods, such as mean and standard deviation calculations. Subgroup analyses were conducted to compare outcomes among different orthopedic procedures (joint replacements, spinal surgeries, and fracture management). Regression analyses and correlation analyses were performed to explore associations between PROs, patient satisfaction, and demographic/clinical factors.

Results

A total of 208 participants who underwent orthopedic procedures were included in this study. Table 1 presents the demographic and clinical characteristics of the study population. The majority of participants were adults aged 18 to 65 years, with a mean age of 52.3 years (SD = 10.7). Among the participants, 45.2% underwent joint replacements, 32.7% underwent spinal surgeries, and 22.1% received fracture management. The distribution of gender was relatively balanced, with 52.4% of participants being male. Detailed information on the demographic and clinical characteristics can be seen in Table 1.

Table 1: Demographic and Clinical Characteristics of the Study Population

Characteristic	N	%
Age (years)		
- Mean (SD)	52.3	10.7
Gender		
- Male	109	52.4
- Female	99	47.6
Procedure		
- Joint replacements	94	45.2
- Spinal surgeries	68	32.7
- Fracture management	46	22.1

PROs were assessed using validated outcome measures specific to each orthopedic procedure. Table 2 summarizes the mean PRO scores for each procedure.

For joint replacements, participants reported significant improvements in pain, physical function, and health-related quality of life as indicated by higher WOMAC and SF-36 scores. Similarly, spinal sur-

gery patients showed reduced disability and improved well-being, as reflected in lower ODI scores and higher SF-36 scores.

Fracture management patients also demonstrated positive outcomes with improved functionality and quality of life, as indicated by higher SF-36 scores and lower DASH or LEFS scores. Detailed PRO scores for each procedure can be seen in Table 2.

Table 2: Patient-Reported Outcome Scores for Orthopedic Procedures

Procedure	N	WOMAC/ODI/PRO Score (Mean ± SD)
Joint Replacements	94	
- WOMAC Pain		75.6 ± 12.3
- WOMAC Function		82.9 ± 8.9
- SF-36 Health		85.2 ± 9.7
Spinal Surgeries	68	
- ODI Disability		24.8 ± 7.5

- SF-36 Well-being		79.4 ± 10.1
Fracture Management	46	
- DASH/LEFS Function		32.1 ± 6.9
- SF-36 Health		81.7 ± 8.3

Patient satisfaction ratings were collected using a structured survey. The mean satisfaction ratings for each procedure are presented in Table 3. Overall, participants reported high levels of satisfaction with their orthopedic procedures.

Joint replacement patients showed high satisfaction with pain relief (mean satisfaction score = 4.6 out of 5) and functional improvement (mean satisfaction score = 4.4 out of 5). Spinal surgery patients

reported high satisfaction with pain management (mean satisfaction score = 4.5 out of 5) and overall treatment (mean satisfaction score = 4.3 out of 5).

Similarly, fracture management patients expressed high satisfaction with pain management (mean satisfaction score = 4.4 out of 5) and functional recovery (mean satisfaction score = 4.2 out of 5). Detailed satisfaction ratings for each procedure can be seen in Table 3.

Table 3: Patient Satisfaction Ratings for Orthopedic Procedures

Procedure	N	Satisfaction Rating (Mean ± SD)
Joint Replacements	94	
- Pain Relief		4.6 ± 0.3
- Functional Improvement		4.4 ± 0.4
Spinal Surgeries	68	
- Pain Management		4.5 ± 0.3
- Overall Treatment		4.3 ± 0.5
Fracture Management	46	
- Pain Management		4.4 ± 0.4
- Functional Recovery		4.2 ± 0.6

Subgroup analyses were conducted to compare outcomes among different orthopedic procedures. Significant differences were found in PRO scores and patient satisfaction ratings across the procedures ($p < 0.001$). Joint replacements consistently demonstrated the highest PRO scores and satisfaction ratings, followed by spinal surgeries and fracture management.

Regression analyses and correlation analyses were performed to explore associations between PROs, patient satisfaction, and demographic/clinical factors. The results of these analyses will be presented separately.

Overall, the findings indicate that orthopedic procedures, including joint replacements, spinal surgeries, and fracture management, result in significant improvements in PROs and high levels of patient satisfaction. The specific outcomes vary depending on the procedure performed. These results highlight the effectiveness of these interventions in addressing pain, functional limitations, and overall well-being in patients undergoing orthopedic procedures.

Discussion

In this study, we assessed patient-reported outcomes (PROs) and satisfaction following various orthopedic procedures, including joint replacements, spinal surgeries, and fracture management. Our results provide valuable insights into the effectiveness of these procedures in

improving PROs and patient satisfaction. The demographic and clinical characteristics of the study population demonstrated a relatively balanced distribution of gender, with 52.4% of participants being male. The majority of participants were adults aged 18 to 65 years, with a mean age of 52.3 years. The distribution of procedures was as follows: 45.2% underwent joint replacements, 32.7% underwent spinal surgeries, and 22.1% received fracture management. These characteristics reflect a diverse sample of patients undergoing different orthopedic procedures, contributing to the generalizability of our findings.

Our assessment of PROs using validated outcome measures specific to each procedure revealed significant improvements in pain, physical function, and health-related quality of life. For joint replacements, participants reported higher WOMAC scores, indicating reduced pain and improved physical function. These findings align with previous studies highlighting the effectiveness of joint replacements in relieving pain and enhancing mobility[13].

The SF-36 scores further confirmed the positive impact of joint replacements on participants' overall well-being. Similarly, spinal surgery patients demonstrated reduced disability, as evidenced by lower ODI scores, along with improved well-being indicated by higher SF-36 scores. These findings are consistent with previous research showing the benefits of spinal surgeries in reducing disability

and improving quality of life[14]. Fracture management patients also exhibited positive outcomes with improved functionality and quality of life, as indicated by higher SF-36 scores and lower DASH or LEFS scores. These results align with the goals of fracture management, which aim to restore function and promote healing in individuals with fractures [15]. Patient satisfaction ratings revealed high levels of satisfaction across all three orthopedic procedures. Joint replacement patients reported high satisfaction with pain relief and functional improvement, highlighting the success of these procedures in alleviating pain and enhancing physical function. Spinal surgery patients expressed high satisfaction with pain management and overall treatment, emphasizing the importance of effective pain management strategies and comprehensive care. Fracture management patients also reported high satisfaction with pain management and functional recovery, indicating successful outcomes in pain relief and restoration of functionality. These results suggest that orthopedic procedures have a positive impact on patients' experiences and overall satisfaction with their treatment. Subgroup analyses comparing outcomes among different orthopedic procedures revealed significant differences in PRO scores and patient satisfaction ratings. Joint replacements consistently demonstrated the highest PRO scores and satisfaction ratings, followed by spinal surgeries and fracture management. These findings may be attributed to the specific goals and expected outcomes of each procedure. Joint replacements, for example, are designed to restore joint function and alleviate pain, resulting in substantial improvements in PROs and satisfaction. Spinal surgeries aim to address spinal deformities and reduce pain, leading to positive outcomes in PROs and satisfaction. Fracture management procedures focus on promoting healing and restoring functionality, which contribute to favorable PROs and satisfaction ratings. Our study has several strengths, including the use of validated outcome measures and a structured survey to assess PROs and satisfaction. The large sample size of 208 participants enhances the generalizability of our findings to a diverse population undergoing orthopedic procedures. However, some limitations should be acknowledged. First, the study design was observational, limiting the establishment of causality between procedures and outcomes.

Second, the follow-up period varied among participants, which may have influenced the assessment of long-term outcomes. Lastly, the convenience sampling method introduces the possibility of selection bias, which should be considered when interpreting the results.

Conclusions

In conclusion, this study provides evidence that orthopedic procedures, including joint replacements, spinal surgeries, and fracture management, lead to significant improvements in PROs and high levels of patient satisfaction.

The specific outcomes vary depending on the procedure performed, with joint replacements consistently demonstrating the highest PRO scores and satisfaction ratings. These findings highlight the effectiveness of these interventions in addressing pain, functional limitations, and overall well-being in patients undergoing orthopedic procedures. Future research should focus on long-term follow-up and explore factors that influence PROs and patient satisfaction to further optimize the outcomes of orthopedic procedures and enhance patient care.

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