

Using Pareto Based Analysis to Identify Priorities for Improving Patient Satisfaction at Muhimbili Orthopaedic Institute

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Short Report

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Using Pareto Based Analysis to Identify Priorities for Improving Patient Satisfaction at Muhimbili Orthopaedic Institute

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Abstract

Introduction

Patient satisfaction is an important indicator of healthcare quality and reflects the extent to which healthcare services meet patient expectations and needs. Patient feedback provides valuable information for understanding healthcare experiences, identifying service gaps, and guiding continuous quality improvement. However, routine collection of patient feedback requires systematic analysis to identify priority areas for intervention.

Objective

To assess patient satisfaction and analyze patient feedback at Muhimbili Orthopaedic Institute (MOI) using a Pareto-based quality improvement approach.

Methods

A hospital-based cross-sectional quality improvement study was conducted using routinely collected automated patient exit interview data at MOI. A total of 810 patient and caregiver responses were analyzed. Patient satisfaction was measured using a five-point Likert scale. Quantitative data were summarized using frequencies, percentages, and weighted Patient Satisfaction Scores (PSS). Qualitative feedback was analyzed using thematic content analysis. Pareto analysis was applied to identify priority areas contributing to patient dissatisfaction.

Results

The overall Patient Satisfaction Score was 85.7%. Among respondents, 45% reported being very satisfied and 42% satisfied, while only 2% reported dissatisfaction. Major positive themes included appreciation of healthcare workers, quality of care, professionalism, and improved service delivery. The main challenges identified were waiting time and service delays, staffing shortages, pharmacy challenges, infrastructure limitations, billing and insurance concerns, diagnostic delays, physiotherapy service gaps, and communication issues. Pareto analysis showed that waiting time and service delays contributed the largest proportion of concerns (20.7%), followed by staffing shortages (10.1%), pharmacy issues (9.2%), infrastructure limitations (8.2%), billing and insurance challenges (7.2%), and diagnostic delays (6.7%). The first seven categories accounted for 80.9% of reported concerns.

Conclusion

Patient satisfaction at MOI was high; however, operational factors significantly influenced patient experience. Pareto-based analysis provided a practical approach for identifying high-impact improvement areas. Continuous monitoring of patient feedback combined with targeted interventions may improve service efficiency and patient-centred care.

Keywords: Patient satisfaction; Patient experience; Quality improvement; Pareto analysis; Health systems; Orthopaedic care

Introduction

Patient satisfaction has become an essential component of healthcare quality assessment and patient-centred care. It provides insight into whether healthcare services are accessible, responsive, effective, and aligned with patient expectations.¹ Patient feedback systems enable healthcare organizations to identify service gaps, improve accountability, and strengthen quality improvement initiatives.²

The Donabedian Structure–Process–Outcome framework describes healthcare quality as a relationship between healthcare structures, service delivery processes, and patient outcomes.³ Structural elements such as human resources, infrastructure, and supplies influence healthcare processes, including communication, waiting times, and clinical workflows, which ultimately affect patient outcomes.

Muhimbili Orthopaedic Institute (MOI) is a national referral institution providing specialized orthopaedic, trauma, neurosurgical, rehabilitation, and prosthetic services. Due to high patient volumes and complex clinical services, monitoring patient experience is essential for improving efficiency and maintaining quality of care.

Although MOI routinely collects patient feedback through automated exit interviews, these data require systematic analysis to identify priority problems and guide quality improvement interventions. Pareto analysis is a widely used quality improvement tool based on the principle that a limited number of causes contribute to most problems.⁴ Therefore, this study aimed to assess patient satisfaction and analyze patient feedback at MOI using a Pareto-based quality improvement approach.

Methods

Study Design and Setting

A hospital-based cross-sectional quality improvement study was conducted at Muhimbili Orthopaedic Institute, Dar es Salaam, Tanzania.

Data Source and Participants

The study utilized routinely collected automated patient exit interview data. Participants included patients and caregivers who received services at MOI and completed the exit survey. A total of 810 valid responses were included in the analysis.

Measurement of Patient Satisfaction

Patient satisfaction was measured using a five-point Likert scale:

- 1 = Very Dissatisfied
- 2 = Dissatisfied
- 3 = Average
- 4 = Satisfied
- 5 = Very Satisfied

The Patient Satisfaction Score was calculated as:

$$PSS = \frac{\text{Observed Weighted Score}}{\text{Maximum Possible Score}} \times 100$$

Qualitative Feedback Analysis

Open-ended patient comments were analyzed using thematic content analysis. Feedback was categorized into service delivery domains including:

- Waiting time and delays
- Staffing
- Pharmacy services
- Infrastructure
- Diagnostic services
- Billing and insurance
- Communication
- Patient flow

Pareto Analysis

Feedback categories were ranked according to frequency. Cumulative percentages were calculated to identify major contributors to patient concerns.

Ethical Considerations

The study utilized routinely collected anonymized patient satisfaction and feedback data generated through the Muhimbili Orthopaedic Institute patient exit interview system as part of routine quality improvement activities. No personal identifiers were collected or analyzed. Data confidentiality was maintained throughout the study. Permission to use the data was obtained from Muhimbili Orthopaedic Institute.

Results

Patient Satisfaction

Among 810 respondents:

Table 1. Patient satisfaction categories

Satisfaction Category Frequency (%)	
Very Satisfied	45
Satisfied	42

Average	11
Dissatisfied	2
Very Dissatisfied	0

The overall Patient Satisfaction Score was **85.7%**.

Patient Feedback Themes

Positive Experiences

Patients reported positive experiences related to:

- Quality of healthcare services
- Healthcare provider commitment
- Professionalism
- Respectful communication
- Improved service delivery

Areas Requiring Improvement

The most common concerns were:

- Long waiting times
- Delays in consultation, treatment, and discharge
- Inadequate staffing
- Pharmacy queues and medicine availability
- Diagnostic delays
- Infrastructure limitations
- Billing challenges
- Communication gaps

Pareto Analysis of Patient Feedback

Table 2. Pareto Analysis of Patient Feedback Concerns

Rank	Priority Issue	Frequency (%)
1	Waiting time and service delays	20.7
2	Staff shortages	10.1
3	Pharmacy challenges	9.2
4	Infrastructure limitations	8.2
5	Billing and insurance concerns	7.2
6	Diagnostic delays	6.7

The first seven categories accounted for **80.9%** of all reported concerns.

Discussion

This study demonstrated a high level of patient satisfaction at MOI, with an overall satisfaction score of 85.7%. The findings suggest that patients generally value the quality of clinical care and the commitment of healthcare providers. However, several operational challenges affecting patient experience were identified.

Waiting time was the most frequently reported concern, consistent with evidence demonstrating that delays in healthcare delivery negatively influence patient satisfaction.⁵ Staff shortages were also identified as important contributors to dissatisfaction. According to the Donabedian framework, structural limitations influence healthcare processes and outcomes.³ Improving workforce allocation and workflow efficiency may therefore improve service responsiveness.

Pharmacy and diagnostic delays highlight the importance of strengthening internal processes and coordination between departments. The Pareto approach demonstrated that addressing a relatively small number of high-impact problems could substantially improve patient experience.

The findings emphasize the value of integrating patient feedback into routine quality improvement systems rather than treating feedback solely as a measurement tool.

Strengths and Limitations

A major strength of this study is the use of routinely collected patient feedback from a large sample of service users, allowing assessment of real-world patient experiences. The application of Pareto analysis provided a practical quality improvement framework for prioritizing interventions.

However, the study was limited by its use of routinely collected data, which restricted the availability of detailed socio-demographic and clinical information. Additionally, the cross-

sectional design does not permit causal inference between identified service challenges and patient satisfaction outcomes.

Quality Improvement Implications

Based on Pareto priorities, MOI should focus on:

1. Reducing waiting time through patient flow redesign.
2. Monitoring turnaround times for key services.
3. Strengthening pharmacy workflow.
4. Improving diagnostic service efficiency.
5. Enhancing patient communication and education.
6. Optimizing staffing and workload distribution.

Conclusion

Patient satisfaction at Muhimbili Orthopaedic Institute was high, with 87% of respondents reporting satisfaction or high satisfaction. Nevertheless, operational challenges remain important determinants of patient experience. Pareto-based analysis provided a practical framework for identifying priority improvement areas. Continuous patient feedback analysis combined with targeted quality improvement interventions can strengthen service delivery efficiency and patient-centred care.

Declarations

Funding

This study received no external funding.

Ethics Approval

Permission to use secondary data for this study was granted by the management of Muhimbili Orthopaedic Institute (MOI) through Reference No. **PA.183/338/01/85**. The study analyzed routinely collected, de-identified institutional data and did not involve direct contact or intervention with patients. No additional ethical approval was required for this quality improvement study in accordance with institutional requirements.

Consent to Participate

Not Applicable.

Consent to Publish

Not Applicable.

Data Availability Statement

The datasets analyzed during the current study are not publicly available because they are the property of Muhimbili Orthopaedic Institute and contain confidential institutional data. Access to the data is restricted under institutional policies, and the datasets are therefore not available for public sharing.

Competing Interests

The authors declare that they have no competing interests.

Authors' Contributions

Barnabas Herman Amlima conceived the study, conducted data analysis, and drafted the manuscript. Zaituni Shabani Bembe contributed to data interpretation and manuscript review. Kennedy Tito Nchimbi supervised the study and critically reviewed the manuscript. All authors read and approved the final manuscript.

Clinical trial number:

Not applicable.

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