

Identification of Priorities for Improving Patient Satisfaction at Muhimbili Orthopaedic Institute

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Abstract

Patient feedback provides health-service managers with information that can be used to identify operational problems and prioritize quality-improvement interventions. However, routine patient-feedback systems may generate large volumes of information without providing a systematic basis for managerial prioritization. This study examined patient satisfaction and applied Pareto analysis to routinely collected patient feedback at a national referral hospital in Tanzania. A hospital-based cross-sectional analysis was conducted using automated patient exit-interview data from 810 patients and caregivers. Satisfaction was measured using a five-point Likert scale. Quantitative responses were summarized using frequencies, percentages and a weighted Patient Satisfaction Score, while open-ended comments were categorized thematically. Pareto analysis was used to identify frequently reported service concerns according to their frequency and cumulative contribution. Overall, 45% of respondents were very satisfied and 42% were satisfied, while 11% reported an average experience and 2% reported dissatisfaction. The seven most frequently reported concern categories were waiting time and service delays (25.06%), staff shortages (11.98%), pharmacy challenges (10.99%), infrastructure limitations (10.00%), billing and insurance concerns (8.64%), diagnostic delays (8.02%), and physiotherapy service gaps (6.30%). Together, these categories accounted for 80.99% of reported concerns. The findings demonstrate that high aggregate patient satisfaction can coexist with recurring operational problems requiring managerial attention. Pareto analysis offers a relatively simple management tool for converting routine patient feedback into prioritized quality-improvement actions. The approach may strengthen evidence-informed decision-making in health-service organizations by linking patient experience data with operational improvement priorities.

Keywords: patient satisfaction; patient experience; health services management; quality improvement; Pareto analysis; hospital management; Tanzania

INTRODUCTION

Patient satisfaction and patient experience have become increasingly important components of healthcare quality and health-service management. Beyond measuring whether patients are satisfied with services received, patient-feedback systems can provide managers with information about accessibility, responsiveness, timeliness and the organization of healthcare delivery. Patient feedback can therefore serve as an operational information source for identifying service deficiencies and supporting continuous quality improvement.

Healthcare quality is multidimensional and extends beyond individual clinical encounters. Donabedian's Structure–Process–Outcome framework provides a useful foundation for understanding how organizational structures influence care processes and outcomes. Structural characteristics include human resources, infrastructure, equipment and organizational arrangements, while processes include activities through which healthcare is delivered. Patient satisfaction represents one of the outcomes through which patients assess their healthcare experiences (Donabedian, 1988).

Patient satisfaction is influenced by multiple dimensions of service delivery. Previous research has identified factors including communication, waiting time, provider behaviour, accessibility, responsiveness, cost and organization of services as important determinants of patients' assessments of healthcare (Ferreira et al., 2023; Mularczyk-Tomczewska et al., 2025). Patient satisfaction should therefore not be viewed only as an outcome of individual provider-patient interactions. It can also reflect the effectiveness of organizational systems through which healthcare services are planned, coordinated and delivered.

For health-service managers, an important challenge is converting patient feedback into actionable priorities. Routine patient-feedback systems can generate substantial numbers of complaints, suggestions, compliments and comments. When these data are presented only as aggregated satisfaction percentages, managers may have limited information about which operational problems require attention. A high overall satisfaction score can therefore coexist with persistent problems affecting specific components of the patient journey.

Recent work on patient experience emphasizes the need to move beyond measurement towards systematic use of patient-generated information for organizational improvement. Adams et al. (2025), for example, describe a framework for translating patient experience data into continuous improvement through structured identification, measurement, partnership, action, checking and transformation.

One approach that can assist this process is Pareto analysis. Pareto charts are commonly used in quality improvement to identify the relatively small number of categories that account for a substantial proportion of observed problems. By ranking problems according to frequency and calculating their cumulative contribution, managers can obtain a practical basis for determining which recurring issues warrant further investigation (Alkiayat, 2021).

The application of Pareto analysis has potential relevance for healthcare organizations operating under resource constraints. Health facilities frequently face competing demands involving staffing, infrastructure, medicines, diagnostics, financing and patient-flow systems. Under such circumstances, identifying frequently recurring operational problems may assist managers in concentrating quality-improvement resources where they can be investigated most systematically.

Muhimbili Orthopaedic Institute (MOI) is a national referral institution in Tanzania providing specialized orthopaedic, trauma, neurosurgical, rehabilitation and related services. The institution manages a high volume of patients and therefore faces complex organizational demands involving patient flow, staffing, diagnostics, pharmacy services, rehabilitation and administrative processes.

MOI routinely collects patient feedback through an automated patient exit-interview system. Such a system provides an opportunity for management to use patient-generated information not only to monitor satisfaction but also to identify operational priorities for quality improvement. However, systematic prioritization of reported concerns is necessary if feedback is to inform management decisions effectively. The present study therefore examined patient satisfaction and applied Pareto analysis to routine patient-feedback data at MOI. Specifically, the study sought to:

1. describe reported levels of patient satisfaction;
 2. identify and categorize the major service-delivery concerns reported by patients and caregivers; and
 3. determine the proportion of reported concerns represented by the most frequently occurring categories.
- The study contributes to health-services management by demonstrating how routinely collected patient-feedback information can be transformed into a practical priority-setting mechanism for hospital quality improvement.

CONCEPTUAL FOUNDATION

The study is informed by two complementary management perspectives: the Structure–Process–Outcome framework and Pareto analysis as a quality-management tool.

The Structure–Process–Outcome framework conceptualizes healthcare quality as a relationship between the resources and organizational arrangements available to a healthcare institution, the processes through which care is delivered, and the outcomes resulting from those processes (Donabedian, 1988). In the present study, staffing, infrastructure, pharmacy capacity and diagnostic resources represent structural dimensions. Waiting time, patient flow, communication and service coordination represent process dimensions, while patient satisfaction represents an important patient-experience outcome.

This framework is useful because many concerns reported by patients may not originate from a single interaction with a healthcare provider. For example, prolonged waiting may reflect registration processes, availability of clinicians, diagnostic capacity, pharmacy queues or coordination between service points. Similarly, dissatisfaction with pharmacy services may reflect medicine availability, dispensing processes, queue management or communication concerning prescriptions.

Patient satisfaction is consequently considered in this study as both an outcome measure and a source of management information. The use of patient experience information can help organizations identify operational problems that may not be apparent from conventional performance indicators alone (Adams et al., 2025).

Pareto analysis provides a complementary management mechanism for prioritizing such problems. Rather than treating all reported concerns as equally frequent, the approach ranks concerns according to their occurrence and calculates their cumulative contribution. This can assist managers in identifying recurring areas that warrant detailed root-cause analysis and targeted improvement (Alkiayat, 2021).

The combination of these perspectives provides a practical pathway from patient feedback to management action:

Patient feedback → problem categorization → frequency analysis → Pareto prioritization → root-cause analysis → quality-improvement intervention → performance monitoring.

This approach positions patient feedback as a management information resource rather than merely a mechanism for measuring satisfaction.

METHODS

Study Design and Setting

A hospital-based cross-sectional analysis of routinely collected quality-improvement data was conducted at Muhimbili Orthopaedic Institute in Dar es Salaam, Tanzania.

The analysis focused on routine patient exit-interview data generated through the institution's patient-feedback system. Data were analyzed to describe satisfaction and identify recurring service-delivery concerns that could inform management and quality-improvement priorities.

Data Source and Participants

The study used automated patient exit-interview data routinely collected at the institution. Eligible respondents were patients or caregivers who had received services and completed the exit survey. A total of 810 valid responses were included in the analysis. The dataset comprised structured satisfaction responses and open-ended comments concerning patients' experiences of healthcare services. Because the study involved secondary analysis of routinely collected institutional data, no additional interaction with patients was undertaken for the purposes of this analysis.

Measurement of Patient Satisfaction

Patient satisfaction was measured using a five-point Likert scale ranging from 1, representing very dissatisfied, to 5, representing very satisfied. Responses were summarized using frequencies and percentages. A weighted Patient Satisfaction Score (PSS) was also calculated from the Likert responses, with higher values representing greater reported satisfaction. Based on the frequencies presented in Table 1, the weighted satisfaction score was calculated using the five response categories. The resulting score was approximately 86.0%.

Analysis of Open-Ended Feedback

Open-ended patient comments were reviewed and grouped according to the principal service-delivery concern expressed in each comment. Thematic categories were developed to capture recurring operational issues. The principal categories included waiting time and service delays, staffing, pharmacy services, infrastructure, billing and insurance, diagnostic services, physiotherapy and other service-related concerns.

Where comments contained more than one issue, each distinct concern was categorized separately. Consequently, the number of reported concerns could exceed the number of respondents.

Positive comments were also reviewed to identify aspects of service delivery that respondents valued, including healthcare quality, staff commitment, professionalism, respectful communication and perceived improvements in service delivery.

Pareto Analysis

The frequency of each concern category was calculated and expressed as a percentage of all categorized concerns. Categories were then ranked in descending order of frequency. A cumulative percentage was calculated by sequentially adding the percentage contribution of each category. The Pareto approach was used to identify the group of categories that collectively accounted for approximately 80% of reported concerns. This threshold was used as a managerial prioritization criterion rather than as evidence that less frequently reported concerns were unimportant.

Data Management and Confidentiality

The analysis was conducted using de-identified routine patient-feedback data. No patient names or direct personal identifiers were included in the analytical dataset. Data were treated as confidential institutional information and were used solely for quality-improvement and research purposes in accordance with institutional requirements.

Ethical Considerations

Permission to use the routinely collected patient-feedback data was granted by Muhimbili Orthopaedic Institute management under Reference No. PA.183/338/01/85. The dataset used for analysis was de-identified and contained no direct personal identifiers. The authors report that, under the applicable institutional requirements for secondary analysis of routinely collected de-identified quality-improvement data, additional ethical approval was not required. For publication, documentary evidence of the institutional determination or permission should be retained and made available to the journal if requested.

RESULTS

Patient Satisfaction

Of the 810 respondents, 365 (45%) reported being very satisfied, while 340 (42%) reported being satisfied. Eighty-nine respondents (11%) rated their experience as average and 16 (2%) reported dissatisfaction. No respondent reported being very dissatisfied. Overall, 705 respondents, equivalent to 87% of the sample, reported being satisfied or very satisfied.

Table 1. Distribution of Patient Satisfaction Responses

Satisfaction category	Frequency (n)	Percentage (%)
Very satisfied	365	45
Satisfied	340	42
Average	89	11
Dissatisfied	16	2
Very dissatisfied	0	0
Total	810	100

The reported aggregate satisfaction level indicates that the majority of respondents had a positive assessment of the services received. Nevertheless, the presence of neutral and dissatisfied responses indicates that aggregate satisfaction alone does not capture all aspects of patient experience. Using scores of 5, 4, 3, 2 and 1 for the five response categories respectively, the weighted Patient Satisfaction Score was approximately 86.0%.

Patient Feedback

Analysis of open-ended comments identified both positive and negative aspects of the patient experience. Positive comments primarily related to perceived quality of healthcare, provider commitment, professionalism, respectful communication and improvements in service delivery.

Negative and improvement-oriented comments identified recurring operational concerns. These included prolonged waiting and service delays, staffing shortages, pharmacy queues and medicine-related challenges, infrastructure limitations, billing and insurance concerns, diagnostic delays, physiotherapy service gaps and communication-related issues. The findings demonstrate that patient satisfaction and service concerns can coexist. Respondents may report an overall positive experience while identifying specific processes that require managerial attention.

Priority Service Concerns

Seven major categories accounted for 80.99% of all reported concerns.

Table 2. Pareto Ranking of Reported Service-Delivery Concerns

Rank	Service concern	Percentage (%)	Cumulative (%)
1	Waiting time and service delays	25.06	25.06
2	Staff shortages	11.98	37.04
3	Pharmacy challenges	10.99	48.03
4	Infrastructure limitations	10.00	58.03
5	Billing and insurance concerns	8.64	66.67
6	Diagnostic delays	8.02	74.69
7	Physiotherapy service gaps	6.30	80.99

Waiting time and service delays were the most frequently reported category, accounting for 25.06% of all reported concerns. Staffing-related concerns represented 11.98%, followed by pharmacy challenges at 10.99% and infrastructure limitations at 10.00%. Billing and insurance concerns represented 8.64%, diagnostic delays 8.02%, and physiotherapy service gaps 6.30%. Together, these seven categories represented 80.99% of the reported concerns. This provides a practical basis for concentrating initial quality-improvement analysis on these operational areas.

DISCUSSION

The study demonstrates how routine patient-feedback information can be used as a management resource for identifying operational priorities. Although 87% of respondents reported being satisfied or very satisfied, the analysis identified a concentration of recurring service concerns relating primarily to waiting time, staffing, pharmacy services, infrastructure, billing and insurance, diagnostics and physiotherapy.

The coexistence of high overall satisfaction and recurring operational concerns is important from a health-services management perspective. An aggregate satisfaction indicator provides information about the general patient experience but may conceal specific operational weaknesses. Management decisions based exclusively on an overall satisfaction percentage may therefore overlook particular processes that generate repeated concerns.

The findings are consistent with the broader literature showing that patient satisfaction is multidimensional and influenced by service organization, accessibility, communication, cost and other aspects of the healthcare experience (Ferreira et al., 2023; Mularczyk-Tomczewska et al., 2025).

Waiting Time and Service Delays

Waiting time and service delays were the most frequently reported concern, accounting for approximately one quarter of all categorized concerns. Timeliness is an important dimension of healthcare service organization because delays can occur at multiple points in the patient journey. Registration, consultation, investigation, treatment, payment, pharmacy and rehabilitation processes may each contribute to the total time spent within a health facility.

From a management perspective, the finding suggests that waiting time should be examined as a system-level process rather than solely as an individual staff-performance issue. Process mapping, time-motion observation, queue analysis and turnaround-time monitoring could be used to identify specific bottlenecks. Such analysis would allow managers to distinguish between delays attributable to staffing, workflow, infrastructure, information systems or interdepartmental coordination.

Staffing

Staff shortages represented the second most frequently reported category. Human resources constitute an important structural component of healthcare delivery. Staffing gaps can influence service capacity, workload, responsiveness and waiting time. However, the present study does not establish that staffing shortages caused reported delays or dissatisfaction.

A subsequent management analysis should therefore examine workload, staffing distribution, peak demand periods, skill mix and service utilization before selecting specific workforce interventions. This distinction is important because patient feedback identifies a perceived problem but does not necessarily establish its underlying cause.

Pharmacy Services

Pharmacy-related concerns were also prominent. Pharmacy processes are an important component of the patient journey because delays in dispensing, medicine availability and communication concerning prescriptions may affect perceptions of service responsiveness. Management interventions may include analysis of pharmacy queue times, prescription-processing time, stock availability, dispensing workflows and communication with patients regarding medicine availability.

Infrastructure

Infrastructure limitations represented another substantial category. Infrastructure can influence the organization and accessibility of services, including waiting areas, consultation spaces, patient movement and availability of appropriate service points. The findings therefore support the integration of patient feedback into infrastructure planning and facility improvement processes.

Billing and Insurance

Billing and insurance concerns accounted for 8.64% of reported concerns. Financial and administrative processes are relevant to patient experience because they frequently occur at the interface between clinical care and institutional administration. Improving communication about charges, insurance coverage, payment procedures and required documentation may reduce avoidable uncertainty and administrative delays.

Diagnostic Services

Diagnostic delays also featured among the priority categories. Timely diagnostics depend on interactions among clinical demand, staffing, equipment availability, specimen or patient movement, reporting processes and communication between clinical and diagnostic departments. Consequently, improvement efforts should examine the complete diagnostic pathway rather than focusing on a single department.

Physiotherapy Services

Physiotherapy service gaps constituted 6.30% of reported concerns. For an institution providing specialized orthopaedic and rehabilitation services, timely access to rehabilitation is an important component of the overall service pathway. Management attention to physiotherapy scheduling, staffing, equipment, patient flow and coordination with clinical services may therefore be relevant.

PATIENT FEEDBACK AS A MANAGEMENT INFORMATION RESOURCE

The principal management implication of this study is that patient feedback can function as an organizational information system for quality improvement. Traditional patient satisfaction reporting often emphasizes the percentage of patients who are satisfied. While this measure is useful, it does not necessarily identify which operational processes should receive managerial attention.

Combining satisfaction measurement with thematic analysis and Pareto prioritization provides a more actionable approach. This is consistent with emerging approaches that emphasize converting patient experience measurement into organizational improvement rather than treating feedback as an endpoint (Adams et al., 2025).

The process can be conceptualized as a management cycle: Collect → Categorize → Quantify → Prioritize → Investigate → Improve → Re-measure. Under this model, the patient-feedback system becomes part of the institution's continuous improvement architecture. Frequently reported concerns can be transferred to quality-improvement teams for root-cause analysis. Interventions can then be assigned to responsible departments, accompanied by measurable indicators and timelines. For example, waiting-time concerns could be linked to indicators such as median registration-to-consultation time, consultation-to-investigation time, pharmacy waiting time and total facility time. Pharmacy concerns could be linked to prescription turnaround time, medicine availability and unresolved pharmacy complaints. Diagnostic concerns could be monitored using investigation turnaround times. This creates a direct connection between patient feedback and operational performance management.

IMPLICATIONS FOR HEALTH-SERVICE MANAGEMENT

The findings have several implications for hospital management. First, patient-feedback systems should not be restricted to monitoring satisfaction scores. They should also generate structured information on specific operational problems.

Second, management teams can use Pareto analysis to identify areas requiring more detailed process investigation. This may assist institutions in allocating limited quality-improvement resources.

Third, patient feedback should be integrated into departmental quality-improvement plans. Priority concerns identified at institutional level can be translated into departmental interventions and monitored through defined indicators.

Fourth, repeated measurement is necessary. A single Pareto analysis identifies the distribution of concerns at a particular point in time but cannot demonstrate whether an intervention has produced sustained improvement. Repeating the analysis periodically would allow management to examine changes in both the frequency of concerns and overall patient satisfaction.

Finally, the approach supports evidence-informed management. Rather than selecting improvement activities solely on the basis of anecdotal reports or managerial perception, institutions can use routinely generated patient data to identify recurrent areas requiring investigation.

QUALITY-IMPROVEMENT AND MANAGEMENT IMPLICATIONS

The findings suggest a structured management response based on the seven priority categories.

Table 3. Suggested Management Response to Priority Concerns

Priority area	Potential management response	Suggested performance measure
Waiting time and service delays	Map patient pathways and identify bottlenecks	Median waiting time; total facility time
Staff shortages	Review workload, staffing distribution and skill mix	Staff-to-demand ratio; workload indicators
Pharmacy challenges	Review dispensing workflow and queue management	Pharmacy turnaround time; unresolved pharmacy concerns
Infrastructure limitations	Identify infrastructure constraints affecting patient flow	Queue capacity; service-point availability
Billing and insurance	Improve information and administrative coordination	Billing resolution time; billing-related complaints
Diagnostic delays	Review end-to-end diagnostic pathway	Diagnostic turnaround time
Physiotherapy service gaps	Review rehabilitation scheduling, staffing and patient flow	Time to physiotherapy; rehabilitation access

The table provides a management-oriented translation of patient feedback into measurable improvement activities. Each intervention should subsequently be subjected to root-cause analysis and assigned to a responsible management unit. A Plan–Do–Study–Act approach could then be used to test interventions on a small scale before wider implementation. Performance should be reviewed periodically through quality-improvement meetings and institutional management structures.

STRENGTHS AND LIMITATIONS

A major strength of the study is its use of routinely collected patient-feedback data involving 810 respondents. The findings therefore reflect actual service users rather than a hypothetical assessment of healthcare quality.

A second strength is the combination of quantitative satisfaction measurement and qualitative analysis of open-ended feedback. This provides complementary information concerning both the overall patient experience and specific operational concerns.

A third strength is the use of Pareto analysis as a relatively simple and potentially reproducible management tool. The method can be incorporated into routine quality-improvement reporting without requiring complex statistical software or advanced analytical capacity.

Several limitations should be considered.

First, the analysis used routinely collected data and therefore the investigators had limited control over the original sampling process. The sample may not represent all patients using the institution.

Second, the cross-sectional nature of the analysis limits causal interpretation. The findings identify reported concerns but cannot establish that particular operational factors caused dissatisfaction.

Third, open-ended responses required categorization by the analysts. Although thematic grouping provides useful management information, different categorization decisions could produce somewhat different distributions.

Fourth, frequency does not necessarily indicate severity. A less frequently reported problem may have more serious consequences than a frequently reported inconvenience. Pareto analysis should therefore be used as a prioritization aid rather than as a substitute for clinical risk assessment.

Finally, the study did not examine associations between patient characteristics, service characteristics and satisfaction outcomes. Future research could incorporate variables such as service point, patient category, waiting time, visit type and demographic characteristics where ethically and operationally appropriate.

CONCLUSION

This study demonstrates that routine patient-feedback data can provide useful information for health-service management beyond the measurement of overall satisfaction. Although 87% of respondents reported being satisfied or very satisfied, patient comments identified recurring operational concerns relating to waiting time, staffing, pharmacy services, infrastructure, billing and insurance, diagnostics and physiotherapy.

Pareto analysis showed that seven categories accounted for 80.99% of reported concerns. This provides a practical basis for focusing management attention on frequently recurring operational problems while recognizing that frequency alone does not determine clinical or organizational importance.

The findings support the integration of patient-feedback systems into routine hospital management and quality-improvement processes. Combining satisfaction measurement with thematic analysis, Pareto prioritization, root-cause analysis and repeated performance measurement may strengthen evidence-informed decision-making and contribute to more responsive patient-centred health services.

The management value of the approach lies not in identifying a single "most important" problem, but in providing a transparent process through which routinely collected patient information can be converted into measurable improvement priorities.

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