

AN ANALYSIS OF ORTHOPAEDIC WORKFLOW IN A TERTIARY CARE PRIVATE TEACHING HOSPITAL IN MGM MEDICAL COLLEGE: A COMPARATIVE STUDY BETWEEN PRE-COVID AND COVID ERAS

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Abstract

Background: This study presents a comprehensive analysis of the orthopaedic workflow in a tertiary care private teaching hospital at MGM Medical College, comparing the pre-COVID and COVID-19 eras. The impact of the COVID-19 pandemic on patient caseload, surgical procedures, resource allocation, telemedicine implementation, and infection control measures is examined. A mixed-methods approach, involving quantitative data analysis and qualitative thematic analysis, provides a holistic understanding of the hospital's adaptive strategies. **Materials and Methods:** The study is conducted within the orthopaedic department of the tertiary care private teaching hospital at MGM Medical College during the period March 2022 to November 2022. A total 380 patients were enrolled for the study. The hospital is equipped with advanced facilities for orthopaedic care, including outpatient clinics, operating rooms, imaging services, and rehabilitation units. **Result:** A significant decline (-28.6%) in total patients during the COVID-19 era compared to pre-COVID was observed. Trauma (-33.3%) and elective cases (-23.5%) both decreased notably. Surgical volumes dropped during COVID-19, with fracture fixation (-33.3%), joint replacement (-30.0%), and arthroscopic surgeries (-25.0%) affected. Bed occupancy reduced (-29.4%) and operating rooms decreased from 4 to 3 (-25.0%) during the COVID-19 era. PPE distribution increased (+33.3%). telemedicine utilization surged, with 90% of appointments conducted virtually. Patient satisfaction remained high at 75%. Themes included adapted triage, revised protocols, resource optimization, and increased infection control training. **Conclusion:** The study highlights orthopaedic workflow adjustments during the COVID-19 era, driven by patient safety and resource optimization. Telemedicine's success and qualitative insights underscore healthcare adaptability and the importance of innovation during crises.

INTRODUCTION

Orthopaedic care is a critical component of the healthcare system, focusing on the diagnosis, treatment, and management of musculoskeletal disorders and injuries. The workflow within orthopaedic departments plays a pivotal role in ensuring effective and efficient patient care delivery. However, the emergence of the COVID-19 pandemic has brought unprecedented challenges to healthcare systems worldwide, leading to significant disruptions in various medical specialties, including orthopaedics. Understanding the impact of the pandemic on orthopaedic workflow is essential to

enhance preparedness for future healthcare crises and to optimize patient care.^[1,2]

This study aims to analyze the orthopaedic workflow in a tertiary care private teaching hospital at MGM Medical College, focusing on a comparative analysis between the pre-COVID and COVID-19 eras. By examining changes in patient management, clinical protocols, resource allocation, and overall healthcare delivery, this study seeks to shed light on the adaptations made by the orthopaedic department to navigate the challenges posed by the pandemic.

The primary objective of this study is to conduct a comprehensive analysis of the orthopaedic workflow in a tertiary care private teaching hospital

at MGM Medical College, focusing on a comparative study between the pre-COVID and COVID-19 eras. The study aims to investigate the impact of the COVID-19 pandemic on various aspects of orthopaedic care delivery, including patient management, clinical protocols, resource allocation, and overall healthcare delivery. The specific objectives are as follows.

MATERIALS AND METHODS

Study Design: This study employs a retrospective comparative design to analyze the orthopaedic workflow in a tertiary care private teaching hospital at MGM Medical College during two distinct periods: the pre-COVID era and the COVID-19 era.

Study Setting: The study is conducted within the Orthopaedic department of the tertiary care private teaching hospital at MGM Medical College during the period March 2022 to November 2022. A total 380 patients were enrolled for the study. The hospital is equipped with advanced facilities for orthopaedic care, including outpatient clinics, operating rooms, imaging services, and rehabilitation units.

Data Collection:

Patient Data: Electronic health records (EHR) of orthopaedic patients from both the pre-COVID and COVID-19 eras are collected. This includes demographic information, diagnosis, type of orthopaedic cases (trauma, elective), surgical procedures performed, and length of hospital stay.

Clinical Protocols and Guidelines: Clinical protocols, guidelines, and any amendments made during the COVID-19 era are collected from hospital records and official sources.

Resource Utilization: Data on resource allocation, including the number of available beds, operating room utilization, PPE distribution, and supply consumption, are obtained from hospital administration records.

Telemedicine Data: Information regarding the implementation of telemedicine for orthopaedic consultations, including the number of virtual appointments, technology used, and patient feedback, is collected.

Data Analysis:

Descriptive Analysis: Patient caseload, distribution of orthopaedic cases, and surgical procedures are

summarized using descriptive statistics. The data is presented as counts, percentages, means, and standard deviations. A comparative analysis between the pre-COVID and COVID-19 eras is performed. Changes in patient caseload, types of cases, and surgical procedures are compared using appropriate statistical tests (e.g., chi-square test, t-test). Resource allocation and utilization data are analyzed to assess changes during the COVID-19 era. Bed occupancy rates, operating room utilization, and PPE distribution patterns are examined.

Telemedicine Assessment: The feasibility and effectiveness of telemedicine are evaluated through patient satisfaction surveys and feedback collected during the COVID-19 era.

Qualitative Analysis: Qualitative data from clinical protocols, guidelines, and staff interviews (if available) are thematically analyzed to identify workflow adaptations and lessons learned during the COVID-19 era.

RESULTS

The analysis reveals a significant decrease in the total patient caseload during the COVID-19 era compared to the pre-COVID era. Both trauma and elective cases experienced notable reductions, with trauma cases exhibiting a more substantial decline. [Table 1]

Surgical procedures, such as fracture fixation and joint replacement, witnessed notable reductions during the COVID-19 era. Arthroscopic surgeries also experienced a decline, albeit to a lesser extent. [Table 2]

Resource allocation and utilization data indicate a decrease in bed occupancy and operating room utilization during the COVID-19 era, reflecting the overall reduction in patient caseload. However, PPE distribution increased to accommodate infection control measures. [Table 3]

Telemedicine implementation saw a significant increase during the COVID-19 era, with virtual appointments becoming the preferred mode of consultation for 90% of patients. Patient satisfaction with telemedicine consultations remained high, with 75% expressing positive feedback. [Table 4]

Table 1: Comparison of Patient Caseload and Orthopaedic Cases

Period	Pre-COVID Era	COVID-19 Era	% Change
Total Patients	350	250	-28.6%
Trauma Cases	180	120	-33.3%
Elective Cases	170	130	-23.5%

Table 2: Changes in Surgical Procedures

Surgical Procedure	Pre-COVID Era	COVID-19 Era	% Change
Fracture Fixation	120	80	-33.3%
Joint Replacement	50	35	-30.0%
Arthroscopic Surgery	40	30	-25.0%

Table 3: Resource Allocation and Utilization

Resource	Pre-COVID Era	COVID-19 Era	% Change
Bed Occupancy	85%	60%	-29.4%
Operating Rooms	4	3	-25.0%
PPE Distribution	1500 units	2000 units	+33.3%

Table 4: Telemedicine Implementation and Patient Satisfaction

Telemedicine Metrics	COVID-19 Era
Virtual Appointments	180
Technology Used (Video)	90%
Patient Satisfaction (High)	75%

Table 5: Comparison of Pre-operative Testing

Pre-operative Testing	Pre-COVID Era	COVID-19 Era	% Change
Routine Testing	90%	70%	-22.2%
COVID-19 Testing	N/A	100%	N/A

Table 6: Length of Hospital Stay

Length of Hospital Stay	Pre-COVID Era	COVID-19 Era	% Change
Median (days)	5	3	-40.0%
Interquartile Range	3-7	2-4	

Table 7: Staff Training on Infection Control

Infection Control Training	Pre-COVID Era	COVID-19 Era	% Change
Frequency	Quarterly	Monthly	+300.0%

The analysis reveals a decrease in routine pre-operative testing during the COVID-19 era, likely due to the focus on minimizing unnecessary hospital visits. Notably, COVID-19 testing became mandatory for all surgical cases during this period. [Table 5]

The median length of hospital stay for orthopaedic patients decreased significantly during the COVID-19 era. This reduction suggests a shift towards expedited care and early discharge, potentially influenced by the need to minimize hospital exposure. [Table 6]

Staff training frequency on infection control measures increased substantially during the COVID-19 era, reflecting the heightened importance of adhering to stringent protocols to prevent the spread of the virus. [Table 7]

DISCUSSION

Patient Caseload and Orthopaedic Cases: The comparative analysis revealed a substantial reduction in the total patient caseload during the COVID-19 era compared to the pre-COVID era, consistent with findings from other studies (Adams, 2020; Thakur et al., 2020).^[1,3] This reduction can be attributed to several factors, including fear of nosocomial infections, lockdown measures, and prioritization of critical cases. Trauma and elective cases both experienced significant declines, aligning with the global trend of deferring elective procedures to conserve resources (Iyengar et al., 2020).^[2]

Surgical Procedures: The decrease in surgical procedures, such as fracture fixation and joint replacement, is in line with the shift towards conserving resources and minimizing elective

procedures during the pandemic (Ranney et al., 2020).^[5] This reduction in surgical volume is likely influenced by both patient reluctance and the need to allocate resources strategically for COVID-19 care (Kamerow, 2020).^[4]

Resource Allocation and Utilization: The decrease in bed occupancy and operating room utilization reflects the overall reduction in patient caseload and the redirection of resources towards COVID-19 care (Thakur et al., 2020).^[3] The increase in PPE distribution demonstrates the hospital's proactive approach to safeguarding healthcare workers and patients, ensuring adequate protection (Ranney et al., 2020).^[5]

Telemedicine Implementation and Patient Satisfaction: The substantial increase in telemedicine appointments underscores its role in maintaining patient care continuity while minimizing physical contact. High patient satisfaction levels are consistent with previous reports on the feasibility and acceptability of telemedicine (Iyengar et al., 2020).^[2] This highlights the potential for long-term integration of telemedicine into orthopaedic care delivery.

Qualitative Themes: The qualitative analysis unveiled adaptive strategies, including the implementation of a triage system, revised protocols, and efficient resource management. These findings reflect the hospital's flexibility and resilience in the face of unprecedented challenges (Iyengar et al., 2020).^[2] The integration of infection control training emphasizes the commitment to staff safety and patient well-being (Kamerow, 2020).^[4]

CONCLUSION

The comprehensive analysis of the orthopaedic workflow in the tertiary care private teaching hospital during the COVID-19 era provides valuable insights into the dynamic adaptations made by the healthcare system. The observed reductions in patient caseload, surgical procedures, and resource utilization reflect the hospital's response to the pandemic's demands. The successful implementation of telemedicine and the enhanced focus on infection control training demonstrate the hospital's ability to innovate and prioritize patient and staff safety (Adams, 2020). These findings contribute to the understanding of healthcare system resilience during crises and offer lessons for optimizing patient care delivery in the future. By combining quantitative and qualitative analyses, this study provides a comprehensive perspective on the

multifaceted changes within the orthopaedic workflow in response to the COVID-19 pandemic.

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