Medical Errors, its Reduction and Prevention Strategies

1Ms. Reshma Rajan, 2Prof. V Shanti, 3Prof. P. V Giri

1Ph.D Scholar, MAHER 2Principal, MAHER FHS 3HOD, Dept. of Kayachikitsa, VAC, Ollur
4Hospital Administration,
3MAHER FHS, Chennai, India

Abstract— Medical errors are faults or failures in healthcare delivery which harm people. These errors can occur at any point in the patient's care process, including diagnosis, treatment, drug administration, and communication. While healthcare personnel play a key role in providing safe and effective care, hospital administration is also responsible for avoiding medical errors. The measures that hospital administration can use to avoid and eliminate medical errors, hence improving patient safety, are discussed here. It entails creating and putting in place rules and procedures for medicine administration, infection control, patient identification, and communication. Adequate resource allocation, including staffing levels, equipment, and technology, is critical for providing safe care. Hospital managers promote a safe culture by encouraging open communication, reporting of errors, and learning from mistakes. They contribute to quality improvement programs by evaluating data, identifying root issues, and putting preventive measures in place. The evaluation emphasizes the advantages of Lean methods for detecting problems and possibilities for improvement, such as process mapping and visual process control. It also addresses how to use Six Sigma tools such as DMAIC methodology and control charts to reduce variance and sustain process improvement. Top management support and dedication are critical for the effective implementation of Lean Six Sigma projects. Healthcare practitioners' knowledge and abilities are improved by ongoing education and training. Errors can be reduced by utilizing healthcare technology systems such as CPOE, EHRs, and barcode medication administration systems. It is critical to collaborate with healthcare professionals through committees and regular meetings. Tracking errors, monitoring patient safety indicators, and establishing accountability mechanisms through audits and performance evaluations are also important responsibilities of hospital administration. It is a collective responsibility towards a common goal of Patient safety.

Index Terms— Medical Error, Reduction, Prevention, Hospital, Lean Six Sigma, DMAIC, Patient safety

1. INTRODUCTION (HEADING 1)

The term “Medical Error” refers to a wide range of events that vary in severity and potential to harm to the patient. The development of adverse outcomes as a result of hazardous care is likely one of the world's top ten causes of mortality and disability. It is believed that one out of every ten patients in high-income countries gets harmed while obtaining hospital care. Globally as many as 4 in 10 patients are harmed in primary and outpatient health care. A variety of undesirable occurrences can cause harm, with approximately half of them being preventable. According to another study up to 80% of harm is preventable. Every year, 134 million adverse events occur in hospitals in low- and middle-income countries (LMICs), resulting in 2.6 million fatalities from hazardous care. Another study found that LMICs account for around two-thirds of all adverse events caused by hazardous care, as well as the years lost to disability and death (known as disability adjusted life years or DALYs).

The most harmful errors are related to diagnosis, prescription, and medication use. Adverse occurrences account for 15% of overall hospital activity and cost in OECD nations. Investing in patient safety can result in significant cost savings and, more significantly, better patient outcomes. Engaging patients is an example of preventive; if done correctly, it can lower the burden of harm by up to 15%.

MEDICAL ERRORS—A SOCIAL MENACE

Medical errors are faults or failures in healthcare delivery that can cause harm to patients. These mistakes can happen at any point during the healthcare process, including diagnosis, treatment, prescription administration, surgery, and communication. Medical errors can have major implications for patients, resulting in extended hospital admissions, incapacity, or even death. Several factors can contribute to the occurrence of medical errors, including: - Healthcare professional fatigue and burnout, which can impair their judgment and decision-making ability.

- A lack of communication and collaboration among healthcare staff, resulting in misunderstandings or missed information.
- Healthcare personnel with insufficient training or knowledge gaps.
- Excessive workload and time constraints, which can increase the chance of errors.
- Healthcare practices and systems that is inefficient or defective.
- Inadequate patient-providers communication, which makes it difficult for patients to understand and adhere to treatment recommendations.

Medical error prevention necessitates a multi-faceted approach involving healthcare professionals, hospital administration, policymakers, and patients.

REVIEW OF LITERATURE
**Importance of Minimizing Medical Errors and Increasing Patient Safety**

S Karande, GA Marraro and C Spada in their study titled Minimizing medical errors to improve patient safety: An essential mission ahead explained the importance of reducing medical errors. The article provides a valuable overview of medical errors as a global public health challenge. It highlights the need for concerted efforts from medical institutions, governments, and healthcare professionals to reduce medical errors and improve patient safety. While there are some areas for improvement, the paper effectively raises awareness about the issue and offers recommendations for mitigating the problem of medical errors. A comprehensive overview of medical errors, covering their definitions, types, and consequences has been given. It also discussed the initiatives taken by medical institutions and governments to address medical errors, such as the establishment of Medical Error Reporting Systems (MERS) and the introduction of care bundles. The paper acknowledges the global nature of the problem, discussing initiatives and research conducted in different countries. It highlights the variations in access to knowledge and safer technologies across different regions of the world. The authors highlight the importance of behavioral modifications among healthcare professionals and the role of technological interventions in reducing medical errors. They provide examples of successful implementations, such as point-of-care ultrasound (POCUS), medication reconciliation, and computerized physician order entry (CPOE) systems.

An article titled "Interventions to Decrease Medical Errors: A Systematic Review of Systematic Reviews" aims to identify and analyze interventions that have the potential to decrease medical errors. The paper provides a brief background on the importance of addressing medical errors and presents the methodology used to conduct a systematic review of systematic reviews. The paper conducted a systematic review of systematic reviews, which provides a comprehensive overview of the available evidence on interventions to decrease medical errors. The search strategy used multiple databases, ensuring a wide coverage of relevant literature. The authors classified the interventions based on medical error type, allowing for a structured analysis and comparison of different intervention types. This classification provides a clear framework for understanding the range of interventions available. The paper highlights the need for policymakers to focus on implementation considerations of selected interventions. This is an important aspect, as the success of interventions depends not only on their effectiveness but also on how well they are implemented in real-world healthcare settings.

**Strategies to Reduce/Prevent Medical Errors**

The study, "Preventing Medication Errors in Hospital Wards: A Qualitative Study," seeks to uncover methods to prevent medication errors in Iranian hospital wards. The abstract summarizes the study's methodology, significant findings, and conclusions. A qualitative content analysis method was utilized to investigate participants' perceptions and experiences with medication errors and prevention strategies. The article emphasizes the practical implications of the findings by suggesting recommendations for in-service training, professional monitoring, and fostering a professional attitude among nurses. These recommendations have the potential to be implemented in healthcare settings to improve patient safety.

There are many studies focusing on application of Lean Six Sigma methodologies in the healthcare sector to address medication errors. These studies bridge the gap in knowledge where they provide a comprehensive overview of Lean and Six Sigma methodologies, including their tools and techniques. They well explained how these methodologies can be employed to improve the medication process and enhance the workplace environment, addressing issues such as excessive workloads, incorrect dosage calculation, and miscommunication. They also specifically targets senior managers and medical directors in hospitals, raising awareness about the role of Lean Six Sigma and its associated tools and techniques in tackling medication errors.

For instance, a study titled Application of Six Sigma DMAIC Methodology to Reduce Medication Errors in a Major Trauma Care Centre in India analyzed the effect of Six Sigma methodology in reducing medication errors in a tertiary care hospital. The study results showed the use of Six Sigma DMAIC methodology resulted in a considerable reduction in prescribing, transcribing, dispensing, administering, and monitoring errors. Sigma values improved in all of these areas, showing improved process performance. The study concluded that the medication usage process is complex, and several measures were used to reduce errors, including improved communication, the use of technology, education, and the development of policy for high-risk drugs. This procedure was optimized by learning from previous medication mishaps. Overall, Six Sigma as an error reduction methodology proved extremely effective in detecting, characterizing, and managing complex hospital systems.

The study titled "Experiences with Lean Six Sigma as improvement strategy to reduce parenteral medication administration errors and associated potential risk of harm" aimed to determine the impact of improvements derived from the Lean Six Sigma strategy on parenteral medication administration errors and potential risk of harm. The study conducted a controlled before-after design to assess the effectiveness of the intervention. The study addresses the significant issue of parenteral medication administration errors and the associated potential risk of harm. It provided relevant background information and highlights the importance of reducing medication errors to improve patient safety and reduce healthcare costs. The study demonstrated the application of Lean Six Sigma methodology to identify and implement improvements in the medication administration process. This approach provides a systematic and structured framework for process improvement. The study presented specific findings regarding medication administration errors and potential risk of harm before and after the implementation of improvement strategies. It identifies the major causes of errors and describes the specific interventions that were implemented, such as substituting bolus injections with infusions, education, and availability of administration information. Overall, the study provided insights into the application of Lean Six Sigma in addressing medication administration errors. It highlighted the need for systematic approaches to improve medication safety. However, the study is limited by its small sample size, lack of detailed statistical analysis, and absence of long-term follow-up. Further research with larger sample sizes and more robust statistical analysis is needed to establish the effectiveness of the Lean Six Sigma strategy in reducing medication errors in the long term.

Trakulsunti et al. (2020) emphasized on Application of Lean Six Sigma to Reduce Dispensing Errors in a Hospital...
Pharmacy. The study employed the action research methodology and follows the Lean Six Sigma DMAIC methodology. The paper demonstrated the practical implementation of Lean Six Sigma in a real-world healthcare setting. It showcased how the DMAIC methodology and associated tools were utilized to improve the dispensing process and reduce errors, leading to improved patient safety. The study reported a significant reduction in dispensing errors, with the number of incidents per 20,000 inpatient days per month decreasing by 66.66%. This tangible improvement in process performance and patient safety highlights the effectiveness of Lean Six Sigma in healthcare. The paper contributed to the existing literature by being the first study to employ a continuous improvement methodology, specifically action research, to improve the dispensing process and enhance the quality of care in a hospital pharmacy. It emphasized the value of applying Lean Six Sigma principles in healthcare settings. The paper provides valuable insights into the application of Lean Six Sigma in reducing dispensing errors in a hospital pharmacy. It presented tangible outcomes in terms of error reduction and improved patient safety. However, the limited generalizability and lack of detailed methodology description are important considerations. Further research in different healthcare settings and more comprehensive methodology descriptions would strengthen the knowledge base on Lean Six Sigma implementation in healthcare. This focus on practical implications makes those relevant and useful for healthcare decision-makers. The articles provide a concise overview of the key findings and implementation considerations related to using Lean and Six Sigma for reducing medication errors. It offers practical guidance and highlights the importance of considering the benefits and challenges before implementing Lean Six Sigma projects. However, these studies could be further enhanced by discussing challenges in more detail and incorporating empirical evidence or case studies to support the effectiveness of these methodologies.

CONCLUSION

The study emphasizes the need for healthcare professionals to act professionally and implement technical strategies to prevent medication errors. It discusses the significance of behavioral modifications, clinical skills, and teamwork in reducing errors. Additionally, it highlights the role of interventions like medication reconciliation and the use of technology, such as electronic medical records and computerized physician order entry systems, in preventing errors. According to the study, a “no blame” safety culture and a healthy working environment are critical for error prevention. This study focuses on the use of Lean Six Sigma to reduce medication errors. Lean tools like process mapping and visual process control help to identify existing problems and potential for improvement. Six Sigma tools, such as DMAIC methodology and control charts reduce variation and maintain process improvement over time. The study underscored the importance of top management support and commitment in implementing Lean Six Sigma projects successfully.

Further research is needed to evaluate the long-term effectiveness and sustainability of these interventions and to explore their applicability in different healthcare contexts.

SUGGESTIONS

Some strategies to reduce medical errors include:

- Improving healthcare professional communication and teamwork through standardized handoff protocols and effective communication tools.
- Improving healthcare professional education and training, including patient safety and medical error prevention continuing education programs.
- Using technology to prevent prescription errors and increase information sharing, such as electronic health records (EHRs) and computerized physician order entry (CPOE) systems.
- Creating a safety culture that fosters reporting of errors and near misses, without fear of retribution, to facilitate learning and improvement.
- Regular quality improvement activities, as well as data analysis on medical errors, to discover patterns, root causes, and areas for improvement.
- Involving patients in their care through shared decision-making, clear information, and encouraging them to ask questions and express concerns.

It is critical to recognize that completely eliminating medical errors may be difficult; however, by implementing proactive measures and continuously striving for improvement, healthcare systems can significantly reduce the occurrence and impact of medical errors, ultimately improving patient safety and outcomes.

REFERENCES


