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Trends in Internal Medicine

Hospital Adverse Events Frequency, What is the Benchmark?

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ABSTRACT

Adverse hospital events continue to be a significant concern for patient safety and quality improvement. On one hand, an adverse event is unexpected and unwanted, but on the other hand, should be clearly and transparently reported to the hospital management and the regulator authority. In this review, we tried to assess the prevalence of adverse events reports and to open discussion about this important issue.

Keywords

Adverse events, Reports, Patient's safety, Medical Risk Management, Quality.

Introduction

Adverse hospital events continue to be a significant concern for patient safety and quality improvement. On one hand, an adverse event is unexpected and unwanted, but on the other hand, should be clearly and transparently reported to the hospital management and the regulator authority. Even today, we never know if a high rate of reports is good (a sign of advanced safety culture) or bad (a sign of low-value medicine). Thus, an evidence-based benchmark is needed. This paper examines the incidence, nature, and reporting of adverse events, based on the publications in the last 2 decades when reporting of adverse events became part of the regulator's demand.

To Err is Human

The phrase "To Err is Human" was coined in a landmark report of the Institute of Medicine (IOM) or, in its new name National Academy of Medicine (NAM) in 1999 [1]. The report emphasized the need for systemic changes to improve patient safety. It determines that errors are inherent parts of systems, including healthcare, and that the focus should be on preventing and mitigating these errors to enhance patient outcomes. A sort of balancing this approach is the "Just Culture" which takes into account the whole range of events from personal negligence to system obstacles [2].

Definition of adverse event

An adverse event is an unintended, undesirable, or harmful outcome, a result of medical treatment, surgery, or invasive procedure, medication administration, misdiagnoses, cross infections, or any other factors that lead to patient harm. Adverse events can be categorized based on their severity and consequences.

Sentinel Adverse Event: A severe incident that indicates an underlying systemic problem and potential risks and deficiencies in patient safety protocols.

Near Miss: A situation where an error occurs but does not lead to actual harm to the patient. It has no risk for a claim and is a valuable opportunity for identifying potential vulnerabilities and implementing preventive measures.

Never Event: An adverse event that is preventable and should never occur such as wrong-site surgery, burn in operation, or leaving foreign objects inside a patient after surgery.

Serious Adverse Event: A significant harm or severe complication, requiring additional medical intervention.

Residual Damage: Consequences that persist after the adverse event has been treated.

Reporting adverse events [3-11]

Reporting adverse events is critical to patient safety and quality improvement in healthcare. It allows for a better understanding of the root causes, patterns, and contributing factors of these incidents. This information, in turn, facilitates the development and implementation of effective preventive measures and safety protocols. Thus, hospitals are encouraged to report all adverse

events, of all kinds. The better the hospital safety culture, the higher the number of reports. A proportion between near-miss adverse events and those with harm may become an indicator for high-value medical treatment.

Incidence of adverse events

The incidence of adverse events varies depending on the type of medical procedure, the complexity of care, and the quality of safety protocols. Many adverse events are preventable. Continuous quality improvement and patient safety plans should be specifically directed toward these preventable mistakes. The Harvard Medical Practice Study I, conducted by Brennan et al. [3] revealed important insights into the incidence of adverse events in hospitalized patients. They reviewed 30121 randomly selected records from 51 hospitals in New York State in 1984. The study reported that 3.7% of patients experienced adverse events during their hospitalization, and 27.6% of these events were due to negligence. 2.6% of the adverse events caused permanent injuries and 13.6% led to death. In the second part of the Harvard research, Leape et al. [4] found that nearly half of the adverse events were preventable, 48% were associated with an operation, 19% were drug complications, 14% were wound infections, and 13% were technical complications. Overall, 28% of the adverse events were judged to have resulted from negligent care, with wide variation among categories. Cullen et al. [5] examined the incident reporting system's effectiveness in detecting adverse events. They found that reporting systems had limitations in capturing adverse events, and supporting systems are urgently needed. de Vries et al. [6] in 2008 published a systematic review, covering the years 1966 to 2007, looking at the incidence and nature of in-hospital adverse events. Eight studies (out of 257) including a total of 74485 records were selected. The study found that 9.2% of hospitalized patients experienced adverse events, with 43.5% of these events being preventable. Medication-related incidents (15.1%) and surgical errors (39.6%) were found to be the most common types of adverse events, 7.4% of events were lethal. Landrigan et al. [7] in 2010, further supported the need to address adverse events proactively to improve patient outcomes. They conducted a retrospective study of 10 hospitals in North Carolina and reviewed 2341 admissions, identifying 25.1 harms per 100 admissions, 63.1% of them preventable. Classen et al. [8] in 2011 utilized the Global Trigger Tool and discovered that adverse event rates in hospitals might be ten times higher than previously estimated. They selected 3 large US tertiary care hospitals and studied 795 medical records during the period of October 2004. Adverse events occurred in 33.2% of admissions. Panagioti et al. [9] in 2019 conducted a systematic review and meta-analysis, revealing the prevalence, severity, and nature of preventable patient harm across medical care settings from 2000 to 2019. They selected 70 studies (out of 7313), including 337025 patients. The pooled prevalence for preventable patient harm was 6%, 12% of which severe or lethal. Eldridge et al. [10] in 2022 examined trends from 2010 to 2019, showing the persistence of adverse events as an ongoing concern in healthcare. The study sample included 190286 hospital discharges, from 3156 hospitals across the US, and found that the rate of adverse events remained unchanged at 70 adverse events per 1000 discharges. Recently, Bates et al. [11] in 2023 emphasized the importance of incorporating artificial intelligence and advanced analytics, to improve early detection of adverse events. They conducted a retrospective cohort study in a random sample of 2809 admissions from 11 Massachusetts hospitals during 2018 and identified at least one adverse event in 23.6%. Of these 22.7% were preventable, 32.3% serious. They used the same method as Brennan et al. [3], studied the same geographic area, yet added artificial intelligence, which made the difference and revealed 6 times more adverse events.

Majda A et al. [12] in 2024 looked at the attitudes of Internal Medicine nurses, Surgical nurses, and Midwives towards reporting clinical adverse events. The study included 745 persons working in a large provincial city in Poland. They found that individual attitudes of nurses and midwives, age, length of service and education can influence the formation of a culture of safety in health care, including the reporting of clinical adverse events.

A literature search since 2019 (the last 5 years), did not reveal studies that directly measured reporting rates of all adverse events in general hospitals, but concentrated on reporting adverse events in specific areas such as COVID-19 vaccines [13], immune-related immune checkpoint inhibitors [14], neoadjuvant treatment of patients with solid tumors [15], intrahospital transport of critically patients [16] and more.

Relationship Between Safety Culture and Adverse Events Reporting

Safety culture refers to the values, attitudes, and behaviors related to safety within an organization [12]. Healthcare professionals have to feel comfortable reporting adverse events without fear. When a safety culture is strong, reporting adverse events becomes an essential learning tool for identifying and addressing system weaknesses and potential hazards. A poor safety culture can discourage reporting, leading to underreporting of adverse events and missed opportunities for improvement.

Summary

Hospital adverse events are undesirable outcomes that occur during hospitalization. They can range from mild incidents to severe complications and death. Different types of adverse events, such as sentinel events, near misses, and never events, are categorized and defined by their severity and preventability. Reporting adverse events is crucial for improving patient safety and implementing preventive measures. Safety culture plays a significant role in promoting open and honest reporting of adverse events and facilitating continuous learning and improvement within healthcare organizations.

Our review is the first to demonstrate a wide range of reporting, and this is the main goal of the paper. We could speculate about the reasons, whether these differences stem from underreporting or improvements in safety practices, but these are only speculations since the true reasons have never been investigated. Our paper did not ask whether there is evidence that supports any progress in the improvement of patient safety.

Adverse events in healthcare continue to pose a significant challenge to patient safety and quality of care. Evidence from seminal studies, systematic reviews, and recent assessments demonstrates the prevalence of adverse events and the potential for preventable harm. Establishing a positive safety culture is crucial in promoting reporting and fostering a learning environment to address these issues proactively. By embracing evidence-based practices and implementing targeted interventions, healthcare organizations can work towards building a safer and more reliable healthcare system for the benefit of patients worldwide.

There are many ways to improve the exposure and finding of adverse events in the clinical world, thus enhancing reporting, root cause analysis, and systemic learning and improvement. Di Giovanni et al. [17] propose a data typology and provide considerations on how to define adverse events within different types of data. Linden M proposes a model for the definition, classification, and assessment of adverse events in psychotherapy [18]. During the COVID-19 pandemic, most of the research efforts are directed towards adverse events of COVID-19 new treatments and immunization [19], which can explain the lack of publication about adverse events reporting in other medical areas.

Conclusion

After all these years, since the IOM declaration in 1999, it is still controversial what is the benchmark for adverse events in the acute hospital setting. There is a wide range of numbers in the literature and a significant difference between reporting and active search for harm. Thus, according to the literature, the rate of adverse events is between 3.7% to 33.2%. We still need more research, comparing actual harm done to that voluntarily reported, to assume the real benchmark that can be referred to.

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