

News Release

Title

Development of a novel scoring system to quantify risks in healthcare: Finding new values in the incident reports using computer processing.

Key Points

- We developed a novel decision-making scoring system to analyze incidents' severity using the semantic characteristics of the free text in incident reports.
- Organizational severity scores were positively associated with severity ratings from patient safety experts and reporters.
- By analyzing other factors using the same methodology, a helpful tool may be developed to improve patient safety.

Summary

A research group led by Yoshimasa Nagao, a professor at the department of patient safety of Nagoya University Graduate School of Medicine, announced that they successfully developed a novel scoring system for decision-making to assess the severity of incidents using the semantic characteristics of the text in incident reports.

Their research attempted to calculate a severity term score, a severity report score, and a severity group score by report volume size. The data were analyzed from more than 9,6000 free-text in incident reports submitted by frontline healthcare workers to the patient safety department. They compared these scores with conventional severity classifications by patient safety experts and reporters. The results showed that organizational severity scores were positively associated with severity ratings from patient safety experts and reporters in all departments. They emphasize that the key of this research was to analyze organizational trends by scoring terms in the free text of incident reports, not single report unit, as reporting quality varies.

Nagoya University Hospital has been actively committing to patient safety and is the first Japanese national university hospital accredited by the Joint Commission International. Traditionally, many attempts have been made to objectively measure patient safety in healthcare organizations worldwide using surveys and questionnaires. Professor Nagao says that these approaches are a helpful but not direct indicator of patient safety, potentially leading to false reassuring.

This research concluded that the scoring system would be generalizable to other healthcare settings, and incident reporting systems have the potential to promote patient safety by providing valuable insights at the organizational level with growing interest in applying computer processing. They believe a helpful tool may be developed to improve organizational patient safety by quantifying other factors using the same methodology.

Research Background

There has been a challenge to measure patient safety in healthcare organizations objectively. Incident reporting systems have become a primary method for improving patient safety worldwide. These systems capture adverse events across hospitals in reports from frontline workers and identify risks in individual organizations but do not measure safety. Although incident reports are highly subjective, the actual value exists in the free-text section, which describes a greater detail of an incident. No studies have explored the use of a decision-making model to quantify the components of patient safety and evaluate organizational trends by scoring terms in the free text of incident reports.

The authors hypothesized that words appearing in incident reports have semantic characteristics that can be used to determine the severity of an incident and that each word can be converted into odds to scale the severity level. Furthermore, the proposed scoring system could help interpret incident severity in multiple incident reports by analyzing trends in terms used.

Research Results

Among the words extracted from incident reports in the training dataset, 1,802 severity term scores were calculated. There was a significant difference in severity report score (average severity score in one report) between reports categorized the severity by experts. Severity group scores (average severity report score in a particular group divided by the number of workers in the group) were positively associated with severity ratings from experts and reporters for all departments.

Research Summary and Future Perspective

This model to anticipate patient safety incident severity from free-text descriptions in incident reports was correlated with ratings given by both

patient safety experts and reporters. With growing interest in applying computer processing to improve patient safety, incident reporting systems can promote patient safety by providing valuable insights at the organizational level. A helpful tool may be developed to contribute to organizational patient safety by quantifying other factors using the same methodology.

Publication

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Development of a Novel Scoring System to Quantify the Severity of Incident Reports: An Exploratory Research Study.

Journal of Medical Systems. 2022 Dec 12;46(12):106.

DOI: 10.1007/s10916-022-01893-1. PMID: 36503962.

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https://www.med.nagoya-u.ac.jp/medicalJ/research/pdf/Jou_230328.pdf