COMPARISON OF FOUR METHODS TO DETECT ADVERSE EVENTS IN HOSPITAL

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Abstrak

Deteksi terjadinya kejadian yang tidak diharapkan (KTD) telah menjadi salah satu tantangan dalam keselamatan pasien oleh karena itu metode untuk mendeteksi terjadinya KTD sangatlah penting untuk meningkatkan keselamatan pasien. Tujuan dari artikel ini adalah untuk membandingkan kelebihan dan kekurangan dari beberapa metode untuk mendeteksi terjadinya KTD di rumah sakit, meliputi review rekam medis, pelaporan insiden secara mandiri, teknologi informasi, dan pelaporan oleh pasien. Studi ini merupakan kajian literatur untuk membandingkan dan menganalisa metode terbaik untuk mendeteksi KTD yang dapat diimplementasikan oleh rumah sakit. Semua dari empat metode telah terbukti mampu untuk mendeteksi terjadinya KTD di rumah sakit, tetapi masing-masing metode mempunyai kelebihan dan kekurangan yang perlu diatasi. Tidak ada satu metode terbaik yang akan memberikan hasil terbaik untuk mendeteksi KTD di rumah sakit. Sehingga untuk mendeteksi lebih banyak KTD yang seharusnya dapat dicegah, atau KTD yang telah terjadi, rumah sakit seharusnya mengkombinasikan lebih dari satu metode untuk mendeteksi, karena masing-masing metode mempunyai sensitivitas berbeda-beda.

Kata Kunci : Kejadian tidak diharapakan, Keselamatan pasien, Rumah Sakit

Abstract

Detecting adverse events has become one of the challenges in patient safety thus methods to detect adverse events become critical for improving patient safety. The purpose of this paper is to compare the strengths and weaknesses of several methods of identifying adverse events in hospital, including medical records reviews, self-reported incidents, information technology, and patient self-reports. This study is a literature review to compared and analyzed to determine the best method implemented by the hospital. All of four methods have been proved in their ability in detecting adverse events in hospitals, but each method had strengths and limitations to be overcome. There is no 'best' single method that will give the best results for adverse events detection in hospital. Thus to detect more preventable adverse events, or adverse events that have already occurred, hospitals should combine more than one method of detection, since each method has a different sensitivity.

***Keyword** : adverse events, patient safety, hospital*

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INTRODUCTION

An adverse event is defined as an injury resulting from a medical intervention, not from the underlying condition of the patient[1], or as an unintended injury caused by medical management, rather than by a disease process, which has resulted in death, life threatening illness, disability at time of discharge, admission to hospital, or prolongation of hospital stay.[2] It has been widely acknowledged that adverse events become major threats for patient safety. Previous studies have revealed that adverse events in health care appeared to be responsible for 44,000 to 98,000 accidental deaths and over one million excess injuries each year.[3] In addition, research by the Quality in Australian Health Care Study showed that adverse events were associated with 16.6% of hospital admissions, with approximately half leading to the admission, and half occurring during the admission. Later, this was associated with mortality in 4.9% of events, or 0.5% of admissions, and permanent disability in 13.7% of events, or in 1% of admissions.[1]

Adverse events, consequently, also resulted in raising some health care costs that may place a great burden on the hospital or health system in general. Previous Australian studies have estimated that direct hospital costs of adverse events in Australia range between $483 million and $900 million per annum.[4,5] It is estimated that money spent on medication will have to be supplemented with other money spent to treat the new health problems caused by medication. Moreover, Edmonds (2006) asserted the importance of indirect costs, often not calculated, including increased insurance premiums, lost opportunity costs, and human costs to both patients (e.g. increased pain, disability, psychological trauma, loss of trust in the health care system, loss of independence and loss of functionality and productivity) and health care professionals (e.g. a loss of morale and confidence, depression, stress, and feelings of frustration, shame, guilt and inadequacy). These serious problems arising from adverse events in hospitals have made patient safety a priority in the health policy agenda.[1]

Unfortunately, many adverse events happening in hospitals were avoidable – in fact, half the adverse events are preventable.[6] Correlating with this, Webb et al. (cited in Richardson & McKie, 2007)[5] found that half the adverse events in the quality of health care study had a high preventability score, and that 60% of the resulting deaths should be avoidable. In addition, detecting adverse events will let hospitals to learn from the mistakes. Thus, methods to detect adverse events become critical for improving patient safety. A range of methods are available for identifying adverse events before or after they happen, such as a manual method, and information technology methods[3]; cross-sectional, prospective and retrospective methods[2]; monitoring or screening the patients' clinical records, or self-reported incidents by healthcare professionals, use of computer systems, and case studies (Walshe, cited in Kellogg & Havens, 2003).[7]

The purpose of this paper is to compare the strengths and weaknesses of several methods of identifying adverse events in hospital, including medical records reviews, self-reported incidents,

information technology, and patient self-reports. It will be argued that each method has its weakness, thus hospitals should combine more than one method to obtain more effective results in identifying adverse events.

METHOD

This study is conducted through literature review on relevant publications, journals and unpublished documents. The four methods to detect adverse events were chosen based on the literature. The strengths and weaknesses of each method to detect adverse event in hospital will be compared and analyzed to determine the best method implemented by the hospital.

RESULT AND DISCUSSION

Medical records have been used widely to collect information for improving medical care, and also monitor adverse events. Generally, retrospective reviews of medical records are used by physicians, nurses or other health professionals after patient discharge from hospital, when records have been held for some time. The example of retrospective reviews of medical records studies was conducted by Kobayashi et al. (2008).[8] The reviews were held in two different stages, and, in the first stage, two groups of trained nurses examined medical records using 18 screening criteria to identify possible adverse events. After confirming any differences, information on the clinical course of the individual patients, and the adverse events themselves, were combined as a case summary. Next, a team of doctors reviewed the records for the presence of one or more of the 18 screening criteria that were identified at the first-stage review, thus determining the presence of adverse events was thus determined.

Some studies have identified the strengths of these medical records retrospective reviews, which have superiority in estimating adverse events in surgery.[2] In addition, Kobayashi et al. (2008)[8] claimed that a high degree of accuracy in identifying adverse events would occur if the medical records contained adequate information. Further, studies based on reviews of medical records have demonstrated that the incidence of adverse events is higher among elderly patients, higher in case of intra-hospital deaths, and increases with the length of stay in hospital, thus indicating that review of medical records has validity as a method.[9] Moreover, as Michel et al. (2004) added, reviews were easily conducted because the documents are already there, and data obtained regularly; the cost of reviews was low and did not put another burden on hospital staff acting as reviewers; and lastly, the method was sometimes favoured by surgical teams and hospital centres.[2]

However, the limitations of retrospective reviews of medical records, according to Brennan et al. (cited in Kobayashi et al, 2008)[8], were as follows: (1) such reviews would be irrelevant if information on the adverse events was not described in the medical records; and (2) even when medical records contain information on the adverse events, such information could be overlooked by the reviewers. In addition, compared with accident reports, reviews based on medical records could not identify some adverse events because of

inadequate description[8]; compared with patient reports, the reviews result in lower numbers of adverse events[10]; and compared with prospective studies, the reviews identified fewer cases of preventable adverse events.[2] Moreover, reviews might result in poor reliability, caused by reviewers' inability to differentiate between cases with respect to the quality of management; by bias related to the type and training of the reviewer (e.g. physician or nurse practitioner); and by the bias of individual reviewers.[9]

Self-reported incidents were a voluntary-based approach, where healthcare professionals report medical events by health care provider, that can be submitted on paper or electronically.[3] According to Michel (2002), in general, an incident report can be initiated by any member of the facility's staff, and then reviewed by the person responsible for the medical care unit, before being forwarded to the quality or risk management department. Despite their wide utilization, self-reported incidents have been relatively unsuccessful, but have still become one of the institution's most used procedures to detect adverse events.[9]

Some researchers or institutions have attempted to improve incidents reporting by continuously reminding health professionals to report adverse events, and they have been more frequently reported where healthcare professionals were sent daily electronic mail reminders to report adverse events, and were asked to report them weekly.[3] However, this result will be different if the reminder system does not apply, with usually lower rates participation by some healthcare professionals, especially physicians. Thus, physicians' participation has become the major challenge in implementing self-reported incidents. In line with this, numerous studies have been conducted to identify the involvement rate of healthcare professionals in reporting incidents – for example, Milch et al. (2005) related the application of a voluntary hospital-based error reporting system in 26 hospitals for 21 months, demonstrating low rates of participation by doctors (less than 2% of total reports).[11] Similarly, reports submitted through the Australian Incident Monitoring System (AIMS) showed that nurses initiated 88% and medical staff only 2% of incidents[14]. Another study comparing incident reporting by physicians, pharmacists and patients, demonstrated that the highest rate of participation was by patients, followed by physicians, while pharmacists reported the lowest number of adverse events[13]; also, compared with midwives, obstetricians indicated that they were less likely to report adverse events, and pediatricians were less likely to report a medical error than nurses were[15]. Milch et al (2005), analysing the reasons behind physicians' low participation, found this was because they do not receive education in the systematic evaluation of errors and adverse events, and thus operate within a belief system of self-blame and personal responsibility, rather than viewing such events as the end process of a series of systematic deficiencies. Additionally, physicians might not report events because of "professional courtesy," i.e., concern about implicating colleagues, or fear of repercussions.[11]

Regarding the methods weaknesses, Weingart et al. (2001)[12] asserted that incident reporting was labour inten-

sive and difficult to sustain. Some studies of the reminder system showed higher results of adverse events reporting only during the study period, with lower participation after the study ended. In addition, incident reports missed many events[12] particularly by junior or less experienced staff[9] and usually had poor physician participation[11,12], This condition had a sturdy relationship with the capability for detecting adverse events, and different attitudes towards them between health professionals.

However, incident reporting systems had the advantage of being less time-consuming than formal studies.[13] In general, Michel (2002) proved that incident reporting took only 3-25 minutes per week to identify adverse events. Additionally, voluntary peer reporting by physicians is inexpensive and acceptable to clinician participants[9]; and facilitated discussions about errors also increased awareness of patient safety.[12]

The development of information technology in adverse events detection consisted of several steps. The collection of patient data in electronic form became the initial step, followed by the application of queries, rules of algorithms to find data that were consistent with adverse events. The final step was the determination of the predictive value of the queries, usually by manual review[16]. In fact, information technology (IT) can be used in numerous ways to detect adverse events continuously and inexpensively. Related to this, Michel (2002) argued that some hospitals have used electronic medical records for preventing adverse events or providing a rapid response after an adverse event has occurred.[9] Several methodologies that use IT to detect adverse events in healthcare settings have been described by Bates and co-workers (cited in Anderson, 2004)[17]. These methodologies comprised the collection of clinical data in electronic form, event monitoring, and natural language processing. All these processes produced data timely enough to permit intervention in time to prevent adverse events from harming patients.

The use of IT had several benefits compared with traditional methods, allowing the detection of nosocomial infections, harm associated with medical procedures such as radiotherapy, ininpatients with adverse drug events, or adverse events attributable to vaccination in outpatients, at the same time.[9] Compared to another adverse events detection methods, computerized monitoring systems identified twice the adverse drug events reported by incident reports[9]; compared to manual review, computerized surveillance had superior sensitivity and required less staff time.[3] However, the cost of software for detecting adverse events might vary, some was free and some expensive.[9] As an example, implementing a computerized system for physician order-entry may cost an average 500-bed facility US$7.9 million in the first year and US$1.3 million each subsequent year, thus questioning the capability of hospitals with limited resources to implement the information technology.

The patient safety movement is concerned with the role of patients in promoting safety, including the opportunity to identify and report adverse events. Generally, as observed above, the incident reports that have been widely used had low physician participation rate. Thus, this problem could be impro-

ved if patients themselves were able to directly submit reports[18].

Recent survey evidence suggested that patients could be good source for adverse event detection. Two recent patient surveys have indicated that 20–42% of patients had experienced an error that could have resulted in serious consequences,[3] while Weingart et al. (2005)[19] claimed that only a few patient-reported incidents were identified in the medical record, though none was submitted by clinicians to the hospital's incident-reporting system. Hence, patients had more effectively reported adverse events compared with medical record reviews and incident reports, and their involvement might reduce the time taken to identify and respond to safety problems[18]. In addition, patients were more likely to report preventable adverse events and 'close calls' (errors that could have caused injury but resulted in no harm), if they had more drug allergies[19].

The major weakness of patient-self reports was patient perceptions of adverse events, including safe care, medical injury and service quality. Weingart et al. (2007)[20] found some patients had misclassified their reports by saying that they had had a "recent unsafe experience". However, after the researcher examined the reports, the events reported by patients were classified as service quality problems. Thus, the issue of validity and usefulness of patient-self-reports needs further research.

All of four methods have been proved in their ability in detecting adverse events in hospitals, but each method had strengths and limitations to be overcome. Medical records reviews were widely applied in hospitals, with data obtained regularly and reviews conducted by either nurses or physicians. The critical factor that affected the successful implementation of reviews, and became the major limitation, was the completeness or otherwise of data. Most of the reviews were conducted by retrospective method, which means data was assessed after patients' discharge, making it difficult to obtain more data and information. If the data in medical records is combined with patient-self report, however, where patients are asked several questions related to adverse events, then the overall data quality will improve. In fact, patient-self reports were done by most hospitals before patient discharge, and unfortunately, the information obtained was more about service quality and patients' satisfaction. Alternatively, to detect more preventable adverse events, reviews could be done every time healthcare professionals added new information, and patient surveys could be done during hospitalization. Further, this regulation should introduced by hospital management for all healthcare professsionals.

Low physician participation rates became a major limitation of self-reported incidents, resulting from concerns, such their different education system, ''professional courtesy'', reluctance to implicate colleagues, or fear of repercussions, all underlying the low rate. In fact, physicians have an essential role in detecting and preventing adverse events, with their educational backgrounds, their skills and their capabilities. Thus, the development of a 'no blame' culture and safety culture in hospitals should become a priority, as well as regulations to protect 'whistle-

blowers', though costs are a major hurdle in implementing the information technology method. Related to this, some hospitals, especially in developing countries, were highly dependent on medical records reviews.

Thus, the implementation of information technology methods still needs to be combined with other methods to enable comparisons, and to complement each other in detecting additional numbers of adverse events. Patients-self reports produced more evidence of adverse events compared with other methods, but patient bias became a major challenge, since adequate patient education was not easy to achieve. In combination with other methods, patients' – self-reports can become good sources of information that might not be provided by other methods, such as incident reports or medical reports reviews.

CONCLUSION

To detect more preventable adverse events, or adverse events that have already occurred, hospitals should combine more than one method of detection, since each method has a different sensitivity. There is no 'best' single method that will give the best results for detection. Hospitals should implement more than one basic method to identify adverse events before and after they occur. Physicians' leading role in detecting adverse events, but low reporting rates, need further investigation. Meanwhile, hospitals should create an environment and culture conducive to placing a priority on safety, and hospitals should initiate the development of a partnership approach with patients to obtain more information about adverse events, since this approach is potentially promising in promoting patients' safety.

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