Occurrence Detection and Selection Procedures in Healthcare Facilities: A Comparison Across Canada and Brazil

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Abstract. Healthcare institutions face high levels of risk on a daily basis. Efforts have been made to address these risks and turn this complex environment into a safer environment for patients, staff, and visitors. However, healthcare institutions need more advanced risk management tools to achieve the safety levels currently seen in other industries. One of these potential tools is occurrence investigation systems. In order to be investigated, occurrences must be detected and selected for investigation, since not all institutions have enough resources to investigate all occurrences. A survey was conducted in healthcare institutions in Canada and Brazil to evaluate currently used risk management tools, the difficulties faced, and the possibilities for improvement. The findings include detectability difficulties, lack of resources, lack of support, and insufficient staff involvement.

Keywords. Investigation, occurrences, detection, adverse events.

Introduction

Risks are an inherent feature of any environment and different tools have been used to manage them. Some industries have developed a wide variety of techniques and are currently in the vanguard of the risk management technology [1]. Several safety tools developed by military researchers have been widely adapted by the healthcare industry [2], being healthcare a high-risk service if compared to other industries [3][4].

In order to improve a risk-prone system it is necessary to investigate occurrences to gain more information about what has happened. Investigation procedures can be conducted using one of several available methodologies [5]. Occurrence awareness is best facilitated by the existence of an occurrence detection system. Without a strong detection system, many of the occurrences in the facility will go unnoticed and will not be investigated. An occurrence detection system consists of any tool available that has been designed with the intent of making the risk management team or investigation team aware of these occurrences. These detection systems can be differentiated as “active” and “passive”. In a passive system, a notification process is available to the users and anybody can report an occurrence. These systems rely on the proactivity of the users and the development of a healthy safety culture [3][6] to generate adequate occurrence reports. The development of a safety culture improves investigations by both providing more resources and improving the engagement of the staff in the investigation process. In contrast, an active system consists of individuals searching the institution for occurrences to be investigated. Classifying occurrences and deciding
which ones should be investigated is just as important as detecting them [7]. Normally institutions make such decisions based on a combination of several factors such as risk levels, regulatory obligations, legal consequences, financial outcomes, and public impact [1][2].

This project was conducted with the objective of assessing the currently used occurrence detection and occurrence selection methodologies in healthcare institutions, with a main purpose of increasing patient safety in healthcare facilities. We hypothesize that in Canada we will find institutions with inadequate occurrence detection systems, yet likely stronger systems than in Brazil. The comparison between Canada and Brazil is interesting because it provides information about two countries with different healthcare and legal systems and therefore different obligations to safety.

1. Material and Methods

This research project consisted of a survey that would allow the evaluation of the currently employed occurrence detection and selection methodologies. It was sent to several clinical engineers and members of risk management groups in healthcare institutions in both Canada and Brazil. This survey was divided into four main categories: questions about demographics and contact information, general questions about the investigation system, questions about the occurrence detection system, and questions about the occurrence selection system. The analysis is presented along with the data.

2. Results and Discussion

Demographic results – This part of the survey consisted of questions regarding the name and location of the hospital. From the 9 collected responses, 5 were from Brazilian hospitals and 4 were from Canadian hospitals.

General questions results – The survey indicated that only 11.0% of the participants did not have access to an investigation system. Regarding the types of occurrences currently investigated, 100.0% of the institutions that have an investigation system investigate near misses and incidents. Only 87.5% of these same facilities investigate accidents. Based on the literature in which institutions usually focus on occurrences with high levels of damage and public awareness, we had hypothesized that we would see a lower percentage of institutions investigating near misses and incidents [1][2], and a larger percentage of institutions investigating accidents. Since the results found were contrary to our hypothesis, it suggests that the participating institutions are aware of the importance of investigating near misses and incidents in addition to investigating accidents.

Occurrence detection results – The next topic we approached was whether the occurrence detection system used active or passive detection tools. The results show that 88.9% of all participants use passive detection tools and that only 22.2% of the participants use some sort of active occurrence detection tool. An interesting detail to provide here is that the two institutions that used active detection tools are located in Brazil. Since Canada has a more developed healthcare system [8], we had hypothesized that we would find a larger number of institutions with active detection systems in Canada than in Brazil. Active detection systems increase the situation awareness of the
institution regarding occurrences by increasing the number of perceived occurrences via the addition of channels through which information about an occurrence can reach the institution [9].

The participants were also asked which tools they use to detect occurrences. 66.7% of the participating institutions use a paper based occurrence notification system, 77.8% use an electronic occurrence notification system, 11.1% use an electronic occurrence detection system, 22.2% use occurrence scouting through the facility, and 11.1% use an electronic registry scouting system.

Since most institutions use only passive detection systems, the largest difficulty faced by the investigation system is underreporting. Some of the tools used by participants to encourage notification include: anonymity (11.1%), feedback about the notification (44.4%), training (55.6%), and safety programs promoting notification (77.8%). As part of encouraging notification, it is important to provide feedback about the investigation both to the person that made the notification and to the staff. Our results indicate that only 56% of the participating institutions provided such feedback to users. However, not receiving feedback can result in a lack of motivation to report future occurrences [1][2].

The passive detection systems discussed above can be separated into two different categories regarding their level of automation: non-automated notification systems which require the investigation team or the risk management team to check a database constantly for new occurrences. Automated notification systems are those that inform the investigation team as soon as an occurrence notification appears in the system. Automated notification systems would reduce the workload on the investigation team and the lag between the notification and the investigation, a lag that usually results in crucial information about the occurrence being lost [1][2][5]. Only 33% of the participating institutions had automated occurrence notification systems, with more of these institutions in Canada than in Brazil. In Canada 50% of the institutions reported automated notification systems, while in Brazil only 20% reported automated systems. These numbers could reflect more developed risk management system in Canadian institutions.

Notification systems can differ on the amount of information they can gather, becoming more precise as more information is collected. A downside to more information is increased workload on the users, consequently reducing the number of notifications due to increased length of the notification form. This can be easily managed by the use of an electronic system with easy to fill forms. Participants were asked about the information collected by their notification system. 100% of the participating institutions collect information about the occurrence, 88.9% collect information about the people involved in the occurrence (such as doctors, nurses, patients, and family members), 77.8% collect information about the victims, 66.7% ask the user to categorize the occurrence (normally into near-misses, incidents, and accidents), and 66.7% collect information about the person making the notification.

The data presented in Figure 1 represents the results and is separated into responses from Brazil and Canada. It appears in the chart that the participating Canadian institutions collect a larger amount of information about occurrences than the participating Brazilian institutions.
This increase in collected information likely reflects a more developed investigative culture in the participating Canadian hospitals since more detailed notifications provide information which can be used to better address risks. These results also show that notification systems still rely on the user categorization of occurrences. This can generate an unwanted variability in the categorization since people will have different perspectives and opinions about the same occurrence. Notification systems should collect information that allows the system to choose the category that occurrence belongs in. Of the participating institutions, 66.7% rely on categorization by the risk management team, 33.3% on categorization by the occurrence investigation team, and 44.4% on the person making the notification. None of the participating institutions have an automated categorization system.

**Occurrence selection results** – All institutions use a different set of criteria to decide which occurrences will be investigated. From the survey data collected, 77.8% of the participating institutions consider the damage level, 66.7% consider the frequency, 66.7% the regulatory obligations, 55.6% the financial outcomes, 44.4% the legal consequences, and 33.3% said that all occurrences should be investigated. These results show an interesting scenario in which not all institutions take into consideration regulatory requirements in decision-making. This can represent two different factors: either the lack of regulatory requirements or non-compliance to the existing requirements. This scenario can be better understood by separating the results into the two different participating countries. In Figure 2, it is possible to see that Canadian institutions take more factors into consideration when deciding which occurrences will be investigated. The differences between the healthcare and legal system in these two countries are replicated by these results, which reflect their different realities. The legal system in Brazil is not as effective as in Canada and very little legal action occurs regarding healthcare occurrences, while in Canada, doctors and hospitals can be prosecuted for malpractice or accidents.

One of the survey questions asked about the difficulties in choosing which occurrences should be investigated. The main difficulties described include: motivating people to notify risk management teams of all the occurrences, detectability issues, staff shortages, lag time between the notification and the investigation, inadequate resources to review and investigate each occurrence, and reliability of the information collected during interviews. These responses show a wide variety of issues that can be addressed by the development of a safety culture, increasing the situation awareness [9] about occurrences, and developing a better understanding of why notification does not occur for some events.
3. Conclusion

In the present study some expected difficulties were seen, but overall fewer problems were detected than were expected. These results also show that investigation teams still struggle with lack of adequate support and resources. The comparison between the two countries showed that the participating Canadian institutions have more developed risk management programs, with more complex notification systems, more selection factors, and better support for the notification. Contrary to our hypothesis, we found more institutions in Brazil than in Canada, using active detection systems. One explanation for this peculiarity may be that the development of risk management programs in Brazil has been very strong in recent years. However, some of the results shown here might be a consequence of the small population size used in this study. Nonetheless, this preliminary research suggests that further investigation into this topic is warranted.

References