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REVIEW

What is the effectiveness of reporting systems in promoting learning in healthcare?

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Abstract

Patient safety in healthcare remains a top priority. Learning from safety events is vital to move towards safer systems. As a result, reporting systems are recognised as the cornerstone of safety, especially in high-risk industries. However, in healthcare, the benefits of reporting systems in promoting learning remain contentious. Though the strengths of these systems, such as promoting a safety culture and providing information from near misses are noted, there are problems that mean learning is missed. Understanding the factors that both enable and act as barriers to learning from reporting is also important to consider. This review, considers the effectiveness of reporting systems in contributing to learning in healthcare.

Key words: Patient safety; Reporting systems; Safety culture; Safety science; Learning in healthcare

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Introduction

This review will consider the effectiveness of healthcare reporting systems in promoting learning to improve patient safety. To explore this topic, the review will be structured as follows: review the background of safety science and reporting systems, consider the components and purpose of reporting systems, appraise the strengths and weaknesses of reporting systems in promoting learning, review barriers and enablers to reporting and consider how to learn from reporting given evolving patient safety science.

Background

Although patient safety as a concept can be traced as far back as Hippocrates' Oath; 'first, do no harm', it is still recognised as the key foundation of quality healthcare (Mitchell, 2008). The focus on patient safety has gained momentum in the last two decades following seminal reports (Kohn, 2000; Donaldson, 2002). Nonetheless, safety continues to be a significant problem; global figures suggest one in ten people suffer harm from healthcare, while in the UK latest figures suggest 22.8% of deaths were avoidable (ONS, 2022). The burden of such harm not only impacts health but also endures significant economic costs.

The shift to the patient safety agenda and appetite to learn from other high-risk industries, such as aviation, demands healthcare systems to be able to learn from incidents (Macrae, 2019). To serve this, reporting and learning systems (RLS) have been established; offer organisations an opportunity to learn from events and make changes to reduce harm. In high-income countries, RLS have become the norm; present both on national and local scales, with criteria for mandatory and voluntary reporting, and corresponding processes for analysis and learning (Mahajan, 2010).

Investment in such systems has been associated with success (Bromiley, 2008). Significant efforts have also been made to raise awareness, improve, and standardise RLS (Larizgoitia et al, 2013). Despite this, the impact has been mixed and some have questioned their scope, utility, and value (Macrae, 2016). Barriers to success include; establishing a safety culture, quality of reporting and lack of sustainable change (Mahajan, 2010).

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Reporting and learning systems

'The most detrimental error is failing to learn from error' (Reason, 1990) elucidates the need for RLS in healthcare. Errors such as delayed or incorrect diagnosis, medication errors and misused equipment carry significant morbidity and mortality, while harm from healthcare institutions can take many forms from pressure ulcers to falls. The purpose of RLS is therefore to capture, collate and analyse incidents to foster learning and improve patient safety (Ahluwalia and Marriott, 2005). To enable this, regardless of size, financial backing or scope, RLS focus on two things: 1) collecting patient safety information by allowing professionals to input data regarding events; 2) use of this information by organisations to make changes to reduce chances of error (Harper, 2005). Although this may appear relatively straightforward, achieving meaningful learning is often hampered by complexities at each level in this process.

The need for an internationally accepted language regarding patient safety and patient safety incidents was a key requirement to build and use RLS effectively (Donaldson, 2009). To this end, work by the World Health Organization (WHO) has been important; the formal definition of patient safety incidents as 'any unintended or unexpected harm during provision of healthcare' was a key milestone (WHO, 2010). Taxonomy has also been established; incidents are classified as a 'near miss' if they do not reach the patient, while those reaching the patients can either be non-harmful (no harm incident) or harmful (harmful incidents). Harmful incidents can be further divided into those that are preventable ('adverse events') or non-preventable ('adverse reactions') (WHO, 2020). Though clarification of definition and classification in this way is important to establish, it highlights the ambiguity existing around incidents and questions previous use, authenticity and comparability of established RLS. It also showcases, the infancy of development and refinement of RLS and thus illustrates how healthcare may be far behind other industries (Macrae and Stewart, 2019).

Strengths

Three of the most important strengths of RLS from the literature are discussed below.

Promote safety and learning in high-risk industries

Reporting and learning systems offer a solution to support continuous learning in high-risk industries where improvements in safety from technology, knowledge and systematic processes mean actual safety incidents may be low or even zero in some cases (Sujan and Furniss, 2015). Indeed, in this way, RLS have been the cornerstone for organisational learning and improved safety in industries such as rail and aviation (Mahajan, 2010).

Healthcare has also benefitted from advances that means the prevalence of actual incidents is low, and so, may not be routinely recognised. Reporting and learning systems therefore offer a unique opportunity for organisations to capture and learn from these 'rare' incidents in order to improve performance and safety. Discovery of such errors by alternative means; malpractice claims data or morbidity and mortality review, is inefficient, costly and focuses more on epidemiology rather than learning (Shojania, 2001). Alternatively, RLS provide a relatively inexpensive means of capturing this information and focuses inherently on improvement (Mahajan, 2010). In addition, RLS are an adaptable forum to gather information of potential value, for example, the value in capturing and use of information 'when things go right' can also be supported by RLS (Hollnagel, 2018).

Near misses

Another major advantage of RLS is the opportunity to learn from reporting of near misses (Mutic et al, 2010). The value of learning from near misses represents a great strength of RLS. Near misses, as opposed to adverse events, are frequent but seldom recorded in the medical notes (Barach, 2000). As a result, RLS offer a means to capture this source of tacit knowledge and form a database of cases for analysis and improvement (Kessels-Habraken et al, 2010). In addition, reporting of near misses may mitigate some of the barriers to

reporting; fear, guilt and the threat of punitive action. Investigation of these incidents may also carry less bias (Shojania, 2001). Finally, the causes of near misses often reflect those of actual events and thus represent an opportunity to reduce morbidity and mortality, with the added benefit of financial savings associated with prevention of harm (Mahajan, 2010).

Providing contextual information

Reporting and learning systems offer a unique advantage in their ability to allow individuals to provide contextual information about events (Mahajan, 2010). Without an appreciation of context, human behaviour cannot be analysed in a meaningful way. Thus, to facilitate learning, context reconstruction is vital (Croskerry, 2009). RLS, in contrast with medical notes review, have been found to be better at providing contextual information (Beckmann et al, 2003). The value in context reconstruction is vital to organisations to help understand how incidents may happen in a complex system.

While RLS offer a window to record important contextual issues related to decision making, they are far from perfect in this regard (Croskerry, 2009). Indeed, not all reports will provide the necessary contextual information required. Nevertheless, we should not underestimate this potential advantage of RLS to elucidate context, but rather, appreciate the complexities regarding context as a dynamic and complex social entity (Bate, 2014).

Limitations

While the advantages are noted, there remains significant concern in the ability of RLS to work effectively (Stavropoulou et al, 2015). A notable example, is the highlighted failure of RLS by prominent reports investigating harm (Kirkup, 2015). In addition, there is scrutiny surrounding the utility of RLS; inherent limitations of RLS and the difficulties in translation from other industries to healthcare (Shojania, 2008). A key issue appears to be the failure of organizations to focus on infrastructure, social responsibility in investigations, and the value of learning and sharing. Instead, there is an overemphasis on the technical aspects of data capture and analysis (Macrae, 2016). Below, four important limitations are explored in further detail.

Over-reporting

The range of what to report is left largely open when we consider the encompassing criteria that describes a patient safety incident (WHO, 2010). The urge to ‘report it all’ is also strengthened by the mis-notion that simply reporting is associated with better safety practice and culture (Hutchinson et al, 2009). While this may be associated with a committed reporting culture, it likely fosters the generation huge quantities of mundane reports that lack focus and brevity. The problem with this, is not only the potential to overwhelm the reporting system, but more importantly the impact on reducing processing and analysis of reports that is key to organisational learning and change (Mitchell et al, 2016).

Under-reporting

On the contrary, there is also the recognised problem of under-reporting. The scope of under-reporting is wide-ranging from healthcare setting to certain professionals and specialities. Doctors have been noted for under-reporting with one study demonstrating that up to 40% of senior doctors had never completed an incident form (Evans, 2006). Other reports, in contrast, have found significant underreporting by nurses who often comprise the largest workforce in healthcare organisations (Benevento et al, 2023). Reasons cited include time, poor safety culture and the fallibility of resulting analysis and potential change (Vincent et al, 1999). Variability of reporting by speciality and healthcare setting has also been noted; interest and demand in reporting from primary care, for example, has been relatively slow when compared to hospitals and in particular acute specialities such as anaesthetics (Kousgaard et al, 2012).

Quality of reporting

Indeed, a good quality report that lends itself easily to analysis and initiates a sequence of actions that prevents the incident from reoccurring is easy to assume, however most reports tend to be far from this ideal. The issue of reports being inadequate, biased and misrepresentative needs to be acknowledged (Macrae, 2016). It may be tempting to lay this blame on individuals, however the problem of poor-quality reports is multifactorial and complex. Some notable examples include fear of discipline from those processing reports and failure of engagement and feedback loop between the clinical team and those investigating the event (Mahajan, 2010).

Misuse of reporting and learning systems

The above factors have elucidated both the variability in reporting and explored problems related to quality. These factors help to expose the potential misuse or abuse of RLS.

For example, given the above limitations, RLS cannot be used as a surrogate representative of overall safety performance (Macrae, 2016). As a result, RLS do not provide meaningful data regarding error rates and so should not be used to measure changes over time or compare organisations (Pham et al, 2013). It is important therefore, to be aware of these limitations and reinforce the purpose of RLS; to provide meaningful insight into patient safety incidents for learning and improvement. Despite this, reporting continues to be used for things outside this objective (Pham et al, 2013)

Barriers and enablers

It is important to review barriers and enablers to reporting as this likely provides insight into the major drivers and roadblocks to learning. The following therefore will consider some of the most important factors and aim to appraise to what extent these can be modified to enhance organisational learning.

Culture

One of the most recognized barriers to reporting is fear by front-line individuals on the handling of reports and subsequent punitive action (Vincent et al, 1999). Not only fear, but prevalence of poor safety culture also greatly threatens the utility of RLS. Indeed, poor safety culture has been noted as a casual factor in preventable harm and deaths (Walshe and Offen, 2001).

The above likely reflects the influence of two distinct paradigms; medical and legal, which sum together to derail reporting and learning (Radhakrishna, 2015).

The medical paradigm refers to the need for healthcare professionals to maintain high professional standards and thus raises the notion that errors are unprofessional acts that constitute moral and ethical failure. To this end, the finding that reporting is more likely when the incident involves deviation from protocol and when there is poor outcome is unsurprising (Lawton, 2002). Additionally, the requirement of healthcare professionals to own up to mistakes means errors and near-misses are laden with fear and anxiety (Mason, 2007).

The legal paradigm is based on ethical principles and outlines the requirement for protection against malpractice and/or negligence. While this is undoubtedly vital, it is open to manipulation, particularly when we consider financial incentives (Radhakrishna, 2015). However, evidence showcases the overwhelming desire from victims for acknowledgement of suffering, but also importantly learning and assurance that the system would improve (Vincent et al, 1994). To this end, the legal standpoint, too often, has ignored the nature of healthcare as a complex system that is inherently prone to error, and instead is often tempted to focus on individual prosecution as a corrective deed (Liang, 2002).

Indeed, the key element of RLS is the willingness of front-line individuals to engage in reporting for the purpose of the greater goal of learning. From the above discussion, it is clear that the prevailing mis-notion that errors are often related to competence and/or malpractice is unfounded (Mahajan, 2010). Wider recognition of this fact has led to the

idea of a 'just culture', which explores wider systemic issues when things go wrong and enables professionals who operate within it to learn (Wolvaardt, 2019). In this approach, accountability must also be considered and it is recognised this must fall on both the individual and the organisation (Boysen, 2013). However, for success, RLS must remain a forum largely independent from accountability if the hope is to foster learning.

Feedback

Another important issue when it comes to reporting is feedback; in one study up to 58% of nurses and 62% of doctors cited lack of feedback as the main barrier which prevented them reporting incidents (Evans, 2006). Indeed, without feedback and engagement with the reporting teams it is difficult to imagine a situation in which reporting would be associated with learning (Gandhi et al, 2005).

The participative and iterative feedback loop between those analysing reports and all other parties involved or affected is a vital component of a successful RLS (Mahajan, 2010). This is perhaps the most fundamental requirement in gaining learning from reporting of incidents. In particular, there is an overwhelming need to share ideas, tacit knowledge and generate change ideas that remain free from blame and aim to create something positive from the experience (Williams et al, 2020). Mechanisms to facilitate this process are varied; some have reported of success with web-based forums or patient safety leadership walk rounds (Amoore and Ingram, 2002). In any case, tangible engagement with clinical teams seem vital to the effectiveness of RLS (Gandhi et al, 2005).

It is likely that the above characteristics are embedded and reflective of those organisations that have a strong safety culture (Hutchinson et al, 2009). Similarly, speciality specific RLS, have been associated with significant success; anaesthesia RLS in the UK, for example, have demonstrated success on a background of firm commitment to independent analysis and iterative feedback loops (Smith and Mahajan, 2009).

Other factors

It is important to acknowledge a constellation of other factors that influence reporting and thus may threaten learning. In addition to the above factors, a recent meta-analysis has identified several other influencing factors; time, access, training, ease of use and adequate organisational support and resources (Mahmoud et al, 2023). It is noteworthy that most of the influences studied pertain to the period before the incident or the direct reporting of the incident. Less literature concentrates, on the arguably more important, influencers of investigation/analysis and change ideas by organisations (Pham et al, 2013). This likely reflects significant focus by organisations on setting up sophisticated systems, rather than shifting attention to learning and change (Mahajan, 2010). This may be because the latter is inherently more difficult.

How to learn from reporting?

As eluded to earlier, the traditional principle linking reporting of incidents and improved patient safety is the idea of learning from errors and near misses (Weaver et al, 2021). This represents the notion that humans interact with others and technology in a complex system where adverse events are related to active failures and latent conditions (Reason, 2000). This concept is commonly referred to the 'human factors approach'. Following an incident, this approach has been used to conduct root cause analysis and implement system redesign. And so, RLS form an important piece of this puzzle.

Despite substantial efforts to use the above approach to support learning, this report has highlighted the problems associated with turning this concept into reality (Locock, 2003). Should we therefore be questioning the merit of this approach entirely? Indeed, there are weaknesses to the above approach (Smith and Plunkett, 2019).

Modern thinking recognises the weaknesses in the idea that incidents occur due to linearity, highlights the idea that the system usually operates well and emphasises the opportunity to promote things that go well (Hollnagel, 2018). These concepts are the

principles behind complexity theory and safety-ii approaches. It follows that RLS may be used in different ways to appreciate the change in the landscape of patient safety theory (Abe et al, 2022). Reinforcing positive deviance is an example of where organisations may seek value in improving safety and reducing harm (Lawton et al, 2014). Indeed, to this end, RLS have been adapted to focus on positive reporting, circumventing some of the cultural and punitive barriers that plague those focused on error (Sinton et al, 2016). Though the merits of this approach are easy to see, there remain issues with identification, sharing and measurement of positive acts. The innovation and strategies that may be required to achieve them is also challenging when we consider that some may fall outside the guidelines and governance principles that organisations demand (Lawton et al, 2014).

The above review of the landscape of safety and the impact on RLS is important to recognise and illustrates the influence of evolving safety theory on the use and purpose of RLS.

Conclusions

This review has considered to what extent RLS in healthcare are effective. Indeed, RLS are recognised as the cornerstone of improving safety, especially when we consider that all high-risk industries have them. However, in healthcare the benefits of reporting systems in promoting learning have not been fully realised. While seeking an ideal where reporting seamlessly promotes learning is still yearned, it may not be realistic. Looking forward, our focus, in my opinion, must be on three things; 1) establishing a blame-free safety culture where the emphasis is on learning rather than judgement; 2) detailed and expert investigation of reports with in-depth reconstruction of events and feedback with staff; 3) avoiding the temptation to focus on short-term solutions like on-off training and rather more on enhancing positive deviance and up-stream organisational reform.

Key points

- Reporting systems in healthcare aim to improve safety culture, learn from near-misses and provide important contextual information.
- Effective use of reporting systems has faced problems including misuse, ineffective reporting and concerns regarding the quality of reports.
- Success of reporting systems relies on formation of effective feedback loops and organisational buy-in to focus on learning and change.
- Learning often relies on root-cause analysis to implement system redesign, but this approach is criticised as too simplistic for complex adaptive system like healthcare.

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