Learning from experience: a qualitative study of surgeons' perspectives on reporting and dealing with serious adverse events

Sina Furnes Øyri [ID],[1,2,3] Kjetil Søreide [ID],[4,5,6] Eldar Søreide,[1,2] Ole Tjomsland [ID][7]

¹Faculty of Health Sciences, University of Stavanger, Stavanger, Norway
²Stavanger University Hospital, Stavanger, Norway
³SHARE Centre for Resilience in Healthcare, University of Stavanger, Stavanger, Norway
⁴Department of Gastrointestinal Surgery, Stavanger University Hospital, Stavanger, Norway
⁵Department of Clinical Medicine, University of Bergen, Bergen, Norway
⁶SAFER Surgery, Surgical Research Group, Stavanger University Hospital, Stavanger, Norway
⁷South-Eastern Norway Regional Health Authority, Oslo, Norway

Correspondence to
Dr Sina Furnes Øyri;
sina.f.oyri@uis.no

ABSTRACT

Introduction In surgery, serious adverse events have effects on the patient journey, the patient outcome and may constitute a burden to the surgeon involved. This study aims to investigate facilitators and barriers to transparency around, reporting of and learning from serious adverse events among surgeons.

Methods Based on a qualitative study design, we recruited 15 surgeons (4 females and 11 males) with 4 different surgical subspecialties from four Norwegian university hospitals. The participants underwent individual semistructured interviews and data were analysed according to principles of inductive qualitative content analysis.

Results and discussion We identified four overarching themes. All surgeons reported having experienced serious adverse events, describing these as part of 'the nature of surgery'. Most surgeons reported that established strategies failed to combine facilitation of learning with taking care of the involved surgeons. Transparency about serious adverse events was by some felt as an extra burden, fearing that openness on technical-related errors could affect their future career negatively. Positive implications of transparency were linked with factors such as minimising the surgeon's feeling of personal burden with positive impact on individual and collective learning. A lack of facilitation of individual and structural transparency factors could entail 'collateral damage'. Our participants suggested that both the younger generation of surgeons in general, and the increasing number of women in surgical professions, might contribute to 'maturing' the culture of transparency.

Conclusion and implications This study suggests that transparency associated with serious adverse events is hampered by concerns at both personal and professional levels among surgeons. These results emphasise the importance of improved systemic learning and the need for structural changes; it is crucial to increase the focus on education and training curriculums and offer advice on coping strategies and establish arenas for safe discussions after serious adverse events.

INTRODUCTION

Despite an increased understanding of the many negative implications of a 'shaming and blaming culture', handling of serious adverse events in surgery still constitutes a

---

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Prior research has indicated that 'shame and blame culture' has a negative psychological effect on surgeons' well-being. In a qualitative perspective, the individual and system effects caused by insufficient transparency and incident reporting of surgical adverse events are not fully explored.

WHAT THIS STUDY ADDS

⇒ This study reports qualitative results of surgeons' experiences related to individual and structural facilitators or barriers to transparency around, reporting of and learning from serious adverse events. Multifactorial risks in surgery may impact surgeons' skill set and self-confidence making them more vulnerable to criticism, which might lead to decreased transparency. A mixture of individual and structural aspects needs to be met to increase transparency and learning from serious adverse events in surgery.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Our results implicate the need of increased focus on education and surgical trainee training curriculums, as well as ensuring peer support and non-sanctioning learning structures for reporting and discussing adverse events.

---

professional and personal issue for surgeons with impact on learning, professional development and patient safety[1–7] (see box 1 for key contextual facts). Previous studies have explored the psychological impact of adverse events on different stakeholders in various hospital settings, especially related to how health professionals in general may suffer from mental distress, burn-out, loss of confidence and how interventions such as psychological or peer support programmes may help in recovery.[8–22] Most of the studies are conducted in the UK or USA.[2 3 10 15 23–29] Only a few studies, mainly based on quantitative data, have focused on surgeons solely.[5 6 30 31]

Several studies have demonstrated that adverse events rates among hospitalised

---

Box 1   Key contextual facts related to surgery in the Norwegian healthcare system[104–106]

Adverse events resulting in patient injuries
⇒ At least one patient injury in 12.8% of somatic hospital admissions, as measured by Global Trigger Tool.
⇒ Patient injuries related to surgery in 4.4% of all somatic hospital stays.
⇒ A cohort study across 28 European countries assessed outcomes after non-cardiac surgery and found an overall mortality risk of 4%. The risk was considerably lower in the Norwegian setting, with a mortality risk of 1.5%.

Public hospitals with surgical departments
⇒ Twenty-two public Hospital Trusts with surgical departments at 56 locations.

Subspecialties
⇒ Eleven subspecialties in surgery.

Surgeons across subspecialties
⇒ A total of 3431 board-certified surgeons across subspecialties.

---

patients remain high despite significant efforts to improve quality and safety. Up to 50% of perioperative adverse events are considered preventable, which makes the occurrence of adverse events a systemic issue.[32–37] Implementation of incident reporting systems with feedback loops to the hospital institutions and bodies responsible for external inspection or accreditation of the healthcare services is reckoned a key effort to reduce the number of adverse events, and this is mandatory in Norwegian hospitals. Health professionals are expected to report adverse events through these systems, and managers are required to do comprehensive follow-up analysis to reveal potential embedded risks and thereby contribute to prevent similar events.[38] Although a previous qualitative study on incident reporting among hospital department managers reported a considerable cultural change over a 10-year course, with less acceptance towards individual blaming and an increased attention on the responsibility of the system as such, most studies demonstrate otherwise.[39] Fear of sanctions and blame may lead to suboptimal incident reporting and limited the use of information to improve patient safety.[39–49] In a context of 'reporting fatigue' and differences in how health professionals evaluate risk, rates of incident reporting are not considered a sufficient standalone indicator of quality and safety.[42 50–52] Knowledge on the effect of transparency and collegial discussions on reporting and learning from adverse events in surgery is therefore crucial for the individual surgeon in addition to a systemic and public perspective.

To the best of our knowledge, this study is the first to report qualitative results of surgeons' experiences related to individual and structural facilitators or barriers to transparency around, reporting of and learning from serious adverse events in a setting outside of the UK and USA. In this study, a serious adverse event was defined as any serious incident as described by the participants, with

no attempt of distinguishing between expected adverse events, calculated complications or between simple mishaps to failure or blatant errors.[52]

Aim and research questions

The aim of the study was to explore individual and structural facilitators and barriers to transparency around, reporting of and learning from serious adverse events among surgeons in a Norwegian context of a universal public healthcare system. Three key research questions were explored:
1. Which factors enable reporting and transparency among surgeons concerning serious adverse events?
2. What barriers do surgeons experience in reporting and discussing serious adverse events?
3. How do serious adverse events and transparency about the events impact learning?

METHODS

Study design and setting

This paper presents results from an inductive exploratory and descriptive study design, based on semistructured individual interviews. We chose an inductive, exploratory and descriptive design with the intent of gaining in-depth knowledge into a novel setting, with attention to data-driven analysis.[53 54]

Participant recruitment and characteristics

Participants were approached by email and recruited by strategic sampling from four university hospitals, one from each of the four Regional Health Authorities in Norway. A strategy of purposive; strategic sampling was chosen based on the logic of achieving 'information rich' samples, by ensuring that participants included held in-depth insights into the phenomenon of adverse events in surgery.[55 56]

All fifteen surgeons (11 men, 4 women, age 38–65 years) with a minimum of 10 years of experience (range 11–38 years) and still clinically active that were invited to participate in the study were included. Seven of the participants were board-certified specialists in gastrointestinal surgery, six participants in cardiothoracic surgery, one in general surgery and one participant in orthopaedic surgery. All except three surgeons currently held or had previously experience from various senior positions with managerial responsibilities, ranging from senior consultant to head of department or division. Geographical distribution: Northern Norway Regional Health Authority (three participants), South-Eastern Norway Regional Health Authority (nine participants), Central Norway Regional Health Authority (two participants), Western Norway Regional Health Authority (one participant).

Data collection

Based on a semistructured interview guide, individual interviews were conducted between December 2021 and February 2022 (each interview approximately 1-hour duration). Due to the COVID-19 lockdown, all interviews

were carried out digitally using virtual meeting software (teams). All interviews were recorded and transcribed. One of the participants requested the transcript returned for comment and correction, and we accommodated this request. We chose to base our data collection on a semi-structured interview guide, rather than a rigid, prefixed guide or survey, as this enabled the researcher to ask the participants follow-up questions based on their response.

Analysis

We analysed the interview data inductively, based on the procedures of qualitative content analysis.[53 54] The analysis consisted of seven procedures, starting with an open reading process of all interview transcripts. We took notes immediately after reading, followed by identification and condensation of all meaning units. Codes and subcategories were proposed, prior to suggesting overarching themes across all 15 interview transcripts. Meaning units, condensed content, codes, subcategories and themes were set up in a separate digital matrix, one for each interview transcript. Additionally, we compiled data manually for each interview, marking different topics, contrasts and similarities by paper and pen. Finally, results from all transcripts were set up in a document with overarching themes and subordinate categories across the entire matrix, with the objective of organising patterns across the data. Subcategories and themes were discussed and refined in collaboration among the researchers.[57]

During the process of writing this manuscript, we cross-checked all transcripts for subcategories related to disadvantages with reporting, peculiarities with surgery in contrast to other medical professions, examples of technical errors and the value of role models and support from managers/seniors. In addition, a quantitative cross-check of the participants' application of various terms ('error', 'misjudgement', 'adverse event/event', 'serious adverse event', 'complication', 'patient injury/severe injury') was performed, referred to as quantitative analysis of qualitative data[58 59] to ensure the reliability of interpretation.

Trustworthiness

The predominant objective with trustworthiness in qualitative research relates to ensuring that the results are worth paying attention to, while aligning with the concepts of credibility, dependability and transferability.[54 60 61] Credibility was assessed with attention to the aim of the study and the sample size.[54 61 62] The interview transcripts demonstrated a comprehensive amount of data, covering a wide range of topics related to processes of transparency around, reporting of and learning from adverse events. Hence, the sample size held adequate information power relevant for this study.[63] The methodological quality of the interview transcripts was checked in accordance with the consolidated criteria for reporting qualitative research.[64] Data stability related to how other researchers are provided with sufficient information to follow the trail of decisions made by the current researchers (dependability) were facilitated by sensible participant selection

and demonstration of the analytical process. By elaborating on the study setting and participant characteristics, this study's results may have the potential of extrapolation to other groups of surgeons, clinicians in general or other geographical contexts (transferability).[62 65]

Patient and public involvement statement

As this study focuses on surgeons' individual experiences concerning transparency around, reporting of and learning from serious adverse events, patient involvement was not considered feasible. However, an early version of the manuscript was presented to a former Patient and User Ombud. Her impact regarding the interpretation of the study's findings on reporting culture, lack of leadership and support, with implications for patient safety was used in the discussion part of the manuscript.

RESULTS
The inductive qualitative content analysis eventually resulted in the identification of four themes

1. Individual factors: the participants described several individual factors influencing serious adverse events.
2. Structural factors: serious adverse events were experienced to have strong associations with structural factors.
3. Negative implications of transparency: transparency of serious adverse events may have negative implications for surgeons personally and professionally, as well as implications for general quality and patient safety.
4. Positive implications of transparency: surgeons considered transparency and sharing of serious adverse events to have positive implications for individual, and systemic learning, as well as having positive impact on the relationship between surgeons, patients and next of kin.

In the following, we present the results theme-wise, including subcategories shown in bullet points for each theme (box 2). The results are accompanied by example quotations from the participants (boxes 3 and 4), and subsequently shortly summarised.

In summary, all surgeons reported having experienced serious adverse events, or misjudgements, describing these as part of 'the nature of surgery'. Most surgeons reported that established strategies failed to combine facilitation of learning with taking care of the involved surgeons. This applied specifically to lack of formalised training and learning to handle consequences of serious adverse events, and to challenging conversations with patients and next of kin.

Accounts of substantial disparity in surgical leaders and colleagues' ability to address serious adverse events were given, 10 of 15 participants described the morbidity and mortality conferences (M&M) as more or less random and unstructured. Some of the surgeons feared that transparency could affect their future career path negatively, although some of them also indicated that by reporting individual technical-related errors, misjudgements and

Box 2 Overarching themes and subcategories

Theme 1: individual factors influencing serious adverse events
⇒ The individual surgeon constitutes a risk factor to patient safety.
⇒ Variation in manual and technical skills that are required.
⇒ Self-confidence affects judgement and decision-making, as well as the willingness to report and share what was considered to be 'individual technical-related errors'.

Theme 2: structural factors influencing serious adverse events
⇒ Embedded risks and complexity/multifactorial risks in surgery.
⇒ Culture for reporting and conducting morbidity and mortality conference.
⇒ Lack of technical training and guidance.
⇒ Lack of training in coping strategies and how to deal with consequences from serious adverse events.
⇒ Manager facilitation of a non-sanctioning working environment.
⇒ Role models and collegial support.

Theme 3: negative implications of transparency
⇒ Fear of sanctions and/or criticism; losing position or seniority.
⇒ Personal discomfort and feeling of guilt.
⇒ Issues with professional identity and confidence in one's skill set.

Theme 4: positive implications of transparency
⇒ The surgeon receives collegial and managerial support.
⇒ The individual burden of guilt gets reduced.
⇒ The surgeon gains trust from patients and next of kin.
⇒ Reporting serious adverse events serves as self-protection against sanctions.
⇒ Positive effects on learning (outcomes).

Box 3 Example quotations for theme 1 individual factors influencing serious adverse events and theme 2 structural factors influencing serious adverse events

Individual factors influencing serious adverse events
⇒ You must be able to stand taking the risk, resist the pressure in executing actions where the margins are small between success and failure. However, we do not want the old-fashioned psychopaths who stood there shouting to everyone around and were masters of the universe; we must have people who approach their profession and their environments with humility, where you must function like a kind of athlete—while at the same time being part of a team. (Participant 1)
⇒ A surgeon who is very uncertain and always considers what might possibly go wrong may undermine the patient's necessary trust. Within many surgery disciplines there is a fine balance between doing too little and doing too much, and between making mistakes or doing it correctly. We decide in favor of something, and afterwards we may say that this was right or possibly wrong. (Participant 8)
⇒ Any error I have made in the operating room has minimal consequences for me. As long as reporting is rather a matter of doing it voluntarily you have to have extremely high ethical standards to do it. (Participant 11)

Structural factors influencing serious adverse events
⇒ We discuss selected complications at morbidity and mortality (M&M) meetings. This entails a lack of personal care for the responsible person. It's very much a matter of chance whether the one reporting receives an encouraging pat on the shoulder or the offer of a debriefing afterwards. (Participant 2)
⇒ One might have spent more time on it (discussion and in-house teaching) but the days are packed and you'd need to gather people. (Participant 13)
⇒ We learn a great deal from the corrections that appear during the M&M meetings. Being particularly aware of a point in an action that might lead to complications. (Participant 15)
⇒ When I started out as a surgeon, I had a very good mentor, leader, being a brilliant role model, always leading by example and sharing his mistakes. That made a culture and atmosphere of transparency and sharing; everyone was expected to make mistakes and one should talk about that and learn from it to avoid it from happening again. (Participant 9)
⇒ After experiencing a major adverse surgical event my leader patted my shoulder and said that behind every great surgeon lies a large graveyard on a good evening. And this is how the talking went at that time, in the early '90s. (Participant 3)

complications, they could protect themselves from sanctions in case of investigation or external inspection. Transparency towards managers and colleagues were by some felt as an extra burden, fearing that transparency of their own or colleagues' errors could affect their reputation. Some participants described how lacking structures or safe arenas at work contributed to their sharing their experiences outside of work, because they simply needed someone to talk to.

The factors of negative impact were described as important obstacles to transparency. Some participants argued that since the surgeon's role as team leader presupposes a high level of self-confidence and courage, attention to and transparency of individual technical-related errors could negatively influence the surgeon's confidence in their skill set. However, positive implications of transparency were linked with factors such as minimising the surgeon's feeling of personal burden; lifting weight off their shoulders, building trust between surgeon and patient or next of kin, and that a culture of collegial sharing positively provides learning opportunities.

Several of the surgeons referred to distinct features of surgery compared with non-surgical specialties, with the association between operating surgeon and appearing adverse events. Although risk in surgery is perceived as

multifactorial, features with the individual surgeon as a risk factor to patient safety were described as strongly attributed to apparent and immediate adverse outcome. Non-surgical specialties were described as having multidisciplinary collaboration and deliberation, resulting in system-oriented adverse events with less potential negative impact on patient outcome. In comparison, surgeons reported their technical skills and individual judgement to have clear impact on patient outcome. All participants reported insufficient structured and formalised training in surgical techniques and lack of learning opportunities on handling wider professional and personal consequences of surgeons' individual

technical-related errors or misjudgements. Participants additionally argued that some non-surgical specialties had developed more sufficient internal systems and routines for professional and personal support and learning compared with surgical specialties. Some described the latter as being related to a stereotypical recruitment to the surgical profession, valuing personal traits such as competitiveness and risk-seeking. Improving selection criteria and supervision in surgery were highlighted as important means for improving quality and safety and refining the professionalism of the specialty. However, most of the participants indicated that the younger generation of surgeons in general combined with the increasing number of women in surgical professions, contribute to maturing the culture with more acceptance and demand for reporting and sharing of challenging experiences.

Box 4   Example quotations for theme 3 negative implications of transparency and theme 4 positive implications of transparency

Negative implications of transparency

⇒ If one is afraid of being considered a less good surgeon, or afraid of losing face among colleagues, or not being allowed to operate any more, one would try to avoid talking about it. (Participant 9)

⇒ Staying silent about everything you do wrong and only talking about successful operations is very common in my profession. (Participant 14)

⇒ I believe that bringing too much emotional reactions into a work environment may seem wrong. A culture of openness in an environment must have a more rational basis. Therefore, the complication meetings were established, because they provide a different context. (Participant 3)

⇒ It is very hard at that moment to say that the surgical procedure did not go well but one must be honest and explain what happened and say that I am deeply sorry. (Participant 7)

⇒ Looking very cynically at it, it (adverse event) generates a great deal of extra work. (Participant 9)

⇒ Therefore, it is much more difficult to admit (errors) because it is a matter of one's technical mastery. (Participant 11)

Positive implications of transparency

⇒ Although this is very tough for the individual both that person and everyone who shared in the experience understand that it is positive because I and all the others will learn from this process. (Participant 14)

⇒ I strongly recommend being open with the family because it lifts the weight from your shoulders and will liberate you from hiding something. (Participant 4)

⇒ I talked with the patient and fully admitted that this was not up to standard, and she tackled this much better than I had expected. (Participant 5)

⇒ I should have tackled this in another way, especially signaling to younger colleagues that it is very positive to talk about this. (Participant 10)

⇒ One key point is that once damage has been done it is vital to limit the effects as much as possible. For this you must be totally open, very early. We still have a long way to go. (Participant 11)

DISCUSSION
Principal results

We explored the experiences of transparency around, reporting of and learning from serious adverse events from 15 surgeons in the Norwegian context. Our results indicate that existing strategies fail to combine facilitation of learning with taking care of the involved surgeons, and substantial disparity in leaders and colleagues' ability to address serious adverse events. Transparency towards patients, next of kin, managers and colleagues, were by some felt as an extra burden, however, it could minimise the surgeon's feeling of personal burden, building trust between surgeon and patient or next of kin, and positively impact learning. Reports were given of a development towards more acceptance and demand for reporting and sharing of challenging experiences related to serious adverse events, argued by several participant to have association with a gender and generational shift in the surgical profession.

Strengths and limitations

This main strength of this study is its dual approach of exploring reporting and transparency associated with serious adverse events, as both an individual issue for surgeons with structural implications that may impact learning, quality and potentially patient safety. The methodological and geographical context along with the substantial clinical experience of the participants holding are also key strengths. This provides the study with comprehensive data of the complexity of risks in surgery. Our data held sufficient information power, and the sample size of 15 participants was adequate and reinforced the results' trustworthiness.[62 63]

Due to qualitative research's scope of exploring limited parts of reality, transferability of results has its limitations. Despite our attempts to balance between gender, age and clinical specialties the distribution of the participants does not fully reflect the current gender and generational balance among surgeons in a Norwegian context. The study reports surgeons' perspectives only limited to a Norwegian setting, which given the gap in knowledge serves as a strength. However, including university hospitals only and not smaller, locally based hospitals, may impact the results related to cultural aspects and maturity related to transparency and reporting. This study explored how serious adverse events may influence surgeons' professional lives mainly and not potential implications on their personal, family lives. The latter could invoke future studies.

Training, learning systems and M&M conferences

We found variation in support and learning systems with predominantly non-systematic training and management follow-up after adverse events. None of the participants had been offered any structured training in dealing with consequences from adverse events during their medical education and surgical trainee training or later in their career. In another study, 55% of the surgeons stated to

have participated in discussions about whether an adverse event was preventable or not, and 26% of those who reported very or somewhat difficult experiences participating in the discussions were more negatively affected by the adverse event.[30] These results demonstrate the importance of disclosure: the factor of potential collective learning about preventability and the negative effects non-disclosure may have on the surgeons. Although our participants mentioned that collegial and managerial discussions after adverse events sometimes occurred, these happened rather infrequently and in an unstructured setting; M&M conferences varied in structure and four participants reported that this type of meeting was not conducted in the department or unit they were affiliated with. One participant even described that M&M conferences had been ceased due to an unfortunate 'shame and blame culture'. These accounts indicate that support and learning systems are randomly and insufficiently present in Norway.

According to a systematic literature review by Vreugdenburg et al,[66] M&M conferences require a system focus to be helpful, but often tend to lack 'defined structure, objectives and resource support'. A survey of consultant surgeons in the UK found that more than one-third of the surgeons did not routinely attend M&M meetings.[67] Results also revealed a willingness to talk about adverse outcomes, but this was constrained by a fear of negative repercussions.[67] Similarly, the American College of Surgeons has highlighted the need for change in the surgical M&Ms current format, to make conferences 'necessary and sufficient'.[68] Our results validate that changes are needed in the structure, content and frequency of M&M meetings in the Norwegian setting, with emphasis on systemic learning.
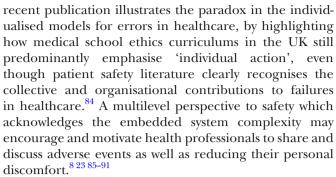
Facilitation of safe arenas and structured peer support

Another predominant finding in this study was anticipation of lacking formal leadership support. Concepts such as 'safe spaces', 'first responders', 'peer support' programmes or 'self-selected buddy relationships' have been launched in other countries.[69–72] The Canadian Patient Safety Institute developed a manual to address the psychological safety of health professionals in general which includes strategies for building leadership support, and a toolkit with examples and recommendations for how to establish and execute a peer support programme.[70] The Brigham and Women's Hospital offers clinicians a team of designated supporters (physicians and nurses).[69] As part of a normalisation of any reactions that the clinician might experience, the designated supporters are trained to call the clinician directly to ask if they think a conversation about what happened could be helpful.[69] A recent evaluation report of the 'buddy' concept implemented in two Danish university hospital departments indicated that a formalised system of peers offering support to health professionals could serve as a 'safe space' after an adverse event, to share their emotional vulnerability and professional insecurities.[72] Ultimately, these past results and

this study indicate that the combination of renewing the structure of dissemination of adverse outcomes in M&M meetings and offering relevant peer support systems may contribute to facilitate reflections and positive learning experiences. This resonates with an important feature in the resilience in healthcare concept where learning from everyday work should add to learning from adverse events.[73 74] The latter is suggested 'less controversial and less threatening' to health professionals after experiencing serious adverse events.[75–77] The positive value of learning from 'near misses': unfortunate events that do not fully unfold into adverse outcome, to improve patient safety was also recently reviewed by Woodier et al.[78]

Surgical trainee training: recruitment and curriculum

All participants in our study reported that they had worked with colleagues that, according to their judgement, should not have been recruited to a surgical path. The issue with variation in skill set among surgeons was recently discussed in the work of Purdy et al,[79] highlighting the importance of developing specific curriculums and assessments related to skills and standards for surgical judgement and leadership even though this is not a part of the formal surgical trainee training. Differences in how for instance general surgery trainees and internal medicine trainees discuss and evaluate risk for surgically complex patients have been confirmed by research in the past.[51] According to Aggarwal[80] risk, complexity and clinical judgement should be seen in conjunction with 'ability of education, quality improvement and health system strategies to affect care for surgically complex patients'. However, our results corroborate the aspects of complexity and multifactorial risks associated with surgery. The combination of individual performance of the surgeon and individual patient factors could make it difficult to manifest errors to the specific operating surgeon, although some of our participants argued that individual performance attributes such as technique, volume and subsequent accountability, are underestimated as risk factors for patient safety. All participants had experienced specific individual errors during their career, which they accounted to having direct association with their application of technique, (mis)judgement or professional experience. Self-confidence in turn, affected their future judgement and decision-making. One of the participants claimed that surgeons used the term 'complication' instead of 'error' to avoid accountability and to signal that the adverse outcome was impossible to avoid. Suggestions were raised to develop a more structured approach to patient injury data, with attention to repetitive individual appearance of surgical complications. These results are not in line with the modern patient safety literature in general. This includes the logic of resilience in healthcare advocating that it is prudent to move away from individualised performance factors as explanatory models for errors in healthcare and encourage more attention to system improvement 'by viewing medical errors as challenges that must be overcome'.[52 74 81–83] A

recent publication illustrates the paradox in the individualised models for errors in healthcare, by highlighting how medical school ethics curriculums in the UK still predominantly emphasise 'individual action', even though patient safety literature clearly recognises the collective and organisational contributions to failures in healthcare.[84] A multilevel perspective to safety which acknowledges the embedded system complexity may encourage and motivate health professionals to share and discuss adverse events as well as reducing their personal discomfort.[8 23 85–91]

Compiled with our results showing a lack of attention to the complex professional and personal processes of dealing with consequences from adverse events in surgical training, facilitating transparency should start with early on recognition of serious adverse events as complexity issues, that often require complex investigation and explanations. We argue that surgeons need to be introduced to the principles and methods for dealing with serious adverse events early on in their education. Introduction to different psychological reactions, and the wider consequences in terms of dealing with patients or next of kin involved in the event, illustrated by simulated scenarios, could give some valuable context to the preparedness required from them as surgeons. Some of the surgeons expressed how they were motivated from participating in this study and wanted to suggest incorporating training sessions in adverse event related coping strategies for young medical students and trainees. In addition to the established criteria for technical professional skills for medical students and surgery trainees, a generic criterion in the national guidelines that points to health professionals' individual responsibility to obtain self-efficacy has been described.[92] We suggest that the curriculum for surgery trainees should align with certain criteria for dealing with consequences from adverse events and surgical judgement that exceeds the current generic of individual responsibility.

Aligning system level and individual level learning by transparency and reporting

Incident reporting is a widespread, internationally recognised effort, aiming at identifying the underlying risks in the systems, to determine whether there is a subsequent need to investigate, analyse or implement further actions.[44 47 49 50 93] Incident reporting as a tool to improving quality and safety is debated in the literature claimed to hamper informal learning opportunities and not necessarily contribute to accurately detecting errors.[43 44 52 94–96] Anonymous reporting could, however, serve as a simple way of putting patient safety on the agenda and thereby creating awareness about risks.[39 42 97 98] Our participants' reactions were not conclusive; on one hand they feared the negative effects from reporting, on the other hand it could protect them from sanctions in case of investigation or external inspection. This duality represents a 'catch 22' for transparency: as surgeons may be more vulnerable to criticism due to the embedded multifactorial risks in surgery and conditions related to individual, technical skills and procedures, this may contribute to decreased transparency from distrust and the fear of shame, blame and various types of sanctions.

As national system audits in Norway have revealed differences across health regions and hospitals in identification of risks and in reporting frequency, the assumption from our study is that obstacles to reporting and transparency occasionally are perceived as overshadowing the facilitators and gains from it.[46] Our data suggest that reporting adverse events through formalised reporting systems, may serve as a supplement to structured routines for meetings and discussions of adverse events at various system levels. This take validates a recent review reporting on the promotion of formal and informal communication and teamwork and how it allows health professionals to consolidate their knowledge, fostering 'leading initiatives to improve patient safety'.[99] The urgency of taking actions to ensure establishment of synergies between health professionals' safety and patient safety is recognised as a key future policy topic and paying attention to the connections between individual surgeon and system factors.[100 101] Illustrated by this study's results, a less fragmented application of for instance M&M conferences, a systemic case-based approach, with boundaries against attention to specific individual performance factors and where aspects of successful activities, techniques and outcomes become part of the discussions, may serve as a means of aligning system-level and individual-level learning. In turn, it may add to meeting the need for safety from both surgeons and patients.

Implications: potential 'collateral damage'

We think that our study reflects transparency as an attribute to both professional safety and quality and patient safety: (1), transparency requires a safe work and learning environment attained by managerial and collegial support, (2) lacking transparency may contradict learning opportunities on both individual and system levels and in that aspect potentially have unfortunate impact on patients. Subsequently, this study raises implications to different stakeholder levels in the healthcare system. The results primarily demonstrate individual implications for surgeons and clinicians in general, as well as for patients. Second, some of the results identify structural issues that need to be addressed. Failing in addressing individual or structural factors that may affect transparency around, reporting of and learning from serious adverse events may result in potential 'collateral damage' harming both surgeons and patients (see figure 1). Thus, part of moving the cultural shift forward is the recognition of barriers to transparency as a patient safety challenge, hampering both collective learning and individual motivation, engagement and learning.[43 84 93] Given these indications, we suggest that hospital management, policy-makers and regulators in the Norwegian healthcare system 'derandomise' support and learning systems in medical education and surgical trainee training.[52] Government bodies
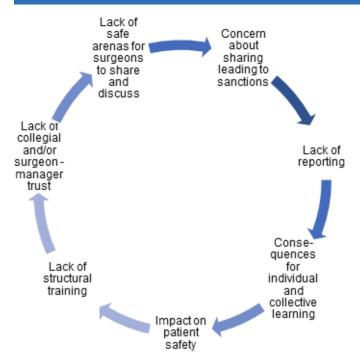
Figure 1 Potential 'collateral damage'.

with their policies and budget allocations have a prudent task in instructing healthcare providers to rig postgraduate clinical education and teaching hospital system in a way that openly address and discuss learning points from serious adverse events in parallel addressing the needs of psychological and peer support for the involved surgeons.

The figure 1 illustrates how this study's results interconnect, entrenching multilevel implications.

This study implicates that transparency of serious adverse events among surgeons represent a complex issue requiring a range of different measures to meet the needs of surgeons' safety and ensuring learning opportunities, both in terms of technical training and inclusion of basic principles and methods related to dealing with serious adverse events. Additional systemic implications are: (1) providing ground for more common approaches to reporting and dealing with adverse events across hospital regions,[46 49] (2) encourage teaching institutions to ensuring sufficient supervision of surgeons during trainee training and [102] (3) contributing to ensuring accountable systems in employment processes by establishing barriers to detect surgeons with recurring professional challenges and need for additional technical skill training or supervision.[103] If these complexities are met from the path of education, during trainee training, at the same time as it is adequately handled by the hospital management, these measures may improve the quality and safety for patients.

CONCLUSION

This study provides valuable insights to individual and structural facilitators and barriers to transparency around, reporting of and learning from serious adverse events among surgeons. The combination of multifactorial risks in surgery and the individual performance

of the surgeon may put skill set and self-confidence on display making them more vulnerable to criticism, which might lead to decreased transparency. Combined with a lack of structured training in coping strategies and lack of trust and support from close colleagues and leaders, the culture of keeping difficult experiences to oneself potentially becomes fortified.

Facilitation of training in coping strategies, ensuring safe arenas for discussions as well as pushing structural changes in education and training curriculums are systems changes that may counteract the unfortunate potential of causing 'collateral damage'. These types of changes are crucial both from an individual surgeons' point of view, and from a system's approach to learning, resilience, quality and patient safety. Further studies are vital to investigate into the wider effects of these structures.

Author note Sina Furnes Øyri; MSc, LLM, PhD; sina.f.oyri@uis.no, Department of Quality and Health Technology, Faculty of Health Sciences, University of Stavanger, Norway; Department of Research, Stavanger University Hospital, Norway. Ole Tjomsland; MD, PhD; ole.tjomsland@helse-sorost.no, South-Eastern Norway Regional Health Authority. Kjetil Søreide, MD, PhD, FRCS (Edin), FACS FEBS (hon), Department of Gastrointestinal Surgery, Stavanger University Hospital, Stavanger, Norway, SAFER Surgery, Surgical Research Group, Stavanger University Hospital, Stavanger, Norway, Department of Clinical Medicine, University of Bergen, Bergen, Norway. Eldar Søreide, MD, PhD, Faculty of Health Sciences, University of Stavanger, Norway, Section for Quality and Patient Safety, Stavanger University Hospital, Norway.

ORCID iDs
Sina Furnes Øyri http://orcid.org/0000-0001-5348-1395
Kjetil Søreide http://orcid.org/0000-0001-7594-4354
Ole Tjomsland http://orcid.org/0000-0002-6035-6768

REFERENCES

1 Balch CM, Freischlag JA, Shanafelt TD. Stress and burnout among surgeons: understanding and managing the syndrome and avoiding the adverse consequences. *Arch Surg* 2009;144:371–6.
2 Shanafelt TD, Balch CM, Bechamps G, *et al*. Burnout and medical errors among American surgeons. *Ann Surg* 2010;251:995–1000.
3 Pinto A, Faiz O, Bicknell C, *et al*. Surgical complications and their implications for surgeons' well-being. *Br J Surg* 2013;100:1748–55.
4 Dimou FM, Eckelbarger D, Riall TS. Surgeon burnout: a systematic review. *J Am Coll Surg* 2016;222:1230–9.
5 Turner K, Johnson C, Thomas K, *et al*. The impact of complications and errors on surgeons. *Bulletin* 2016;98:404–7.
6 Turner K, Bolderston H, Thomas K, *et al*. Impact of adverse events on surgeons. *Br J Surg* 2022;109:308–10.
7 Serou N, Sahota L, Husband AK, *et al*. Systematic review of psychological, emotional and behavioural impacts of surgical incidents on operating theatre staff. *BJS Open* 2017;1:106–13.
8 Wu AW. Medical error: the second victim. The doctor who makes the mistake needs help too. *BMJ* 2000;320:726–7.
9 Aasland OG, Førde R. Impact of feeling responsible for adverse events on doctors' personal and professional lives: the importance of being open to criticism from colleagues. *Qual Saf Health Care* 2005;14:13–7.
10 Daniels AH, DePasse JM, Kamal RN. Orthopaedic surgeon burnout: diagnosis, treatment, and prevention. *J Am Acad Orthop Surg* 2016;24:213–9.
11 Førde R, Aasland OG. Is imperfection becoming easier to live with for doctors? *Clin Ethics* 2017;12:31–6.
12 Cabilan CJ, Kynoch K. Experiences of and support for nurses as second victims of adverse nursing errors: a qualitative systematic review. *JBI Database System Rev Implement Rep* 2017;15:2333–64.
13 Willis D, Yarker J, Lewis R. Lessons for leadership and culture when doctors become second victims: a systematic literature review. *Leader* 2019;3:81–91.
14 Lane MA, Newman BM, Taylor MZ, *et al*. Supporting clinicians after adverse events: development of a clinician peer support program. *J Patient Saf* 2018;14:e56–60.
15 Stone M. Second victim support programs for healthcare organizations. *Nurs Manage* 2020;51:38–45.
16 White RM, Delacroix R. Second victim phenomenon: is 'just culture' a reality? An integrative review. *Appl Nurs Res* 2020;56:151319.
17 Schiess C, Schwappach D, Schwendimann R, *et al*. A transactional "second-victim" model-experiences of affected healthcare professionals in acute-somatic inpatient settings: a qualitative metasynthesis. *J Patient Saf* 2021;17:e1001–18.
18 Scarpis E, Castriotta L, Ruscio E, *et al*. The second victim experience and support tool: a cross-cultural adaptation and psychometric evaluation in Italy (IT-SVEST). *J Patient Saf* 2022;18:88–93.
19 Shapiro J, McDonald TB. Supporting clinicians during COVID-19 and beyond - learning from past failures and envisioning new strategies. *N Engl J Med* 2020;383:e142.
20 Berman L, Rialon KL, Mueller CM, *et al*. Supporting recovery after adverse events: an essential component of surgeon well-being. *J Pediatr Surg* 2021;56:833–8.
21 Busch IM, Moretti F, Purgato M, *et al*. Dealing with adverse events: a meta-analysis on second victims' coping strategies. *J Patient Saf* 2020;16:e51–60.
22 Busch IM, Moretti F, Campagna I, *et al*. Promoting the psychological well-being of Healthcare providers facing the burden of adverse events: a systematic review of second victim support resources. *Int J Environ Res Public Health* 2021;18:5080.
23 Han K, Bohnen JD, Peponis T, *et al*. The surgeon as the second victim? Results of the Boston intraoperative adverse events surgeons' attitude (BISA) study. *J Am Coll Surg* 2017;224:1048–56.
24 Carugno J, Winkel AF. Surgical catastrophe. Supporting the gynecologic surgeon after an adverse event. *J Minim Invasive Gynecol* 2018;25:1117–21.
25 Herring JA. Complications: second victim. *J Pediatr Orthop* 2020;40 Suppl 1:S22–4.
26 Biggs S, Waggett HB, Shabbir J. Impact of surgical complications on the operating surgeon. *Colorectal Dis* 2020;22:1169–74.
27 Pereira L, Radovic T, Haykal KA. Peer support programs in the fields of medicine and nursing: a systematic search and narrative review. *Can Med Educ J* 2021;12:113–25.
28 Siddaiah-Subramanya M, To H, Haigh C. The psychosocial impact of surgical complications on the operating surgeon: a scoping review. *Ann Med Surg (Lond)* 2021;67:102530.
29 Sattar K, Yusoff MSB, Arifin WN, *et al*. Effective coping strategies utilised by medical students for mental health disorders during undergraduate medical education-a scoping review. *BMC Med Educ* 2022;22:121.
30 Elwy AR, Itani KMF, Bokhour BG, *et al*. Surgeons' disclosures of clinical adverse events. *JAMA Surg* 2016;151:1015–21.
31 Lipira LE, Gallagher TH. Disclosure of adverse events and errors in surgical care: challenges and strategies for improvement. *World J Surg* 2014;38:1614–21.
32 Kable AK, Gibberd RW, Spigelman AD. Adverse events in surgical patients in Australia. *Int J Qual Health Care* 2002;14:269–76.
33 Zegers M, de Bruijne MC, Wagner C, *et al*. Adverse events and potentially preventable deaths in Dutch hospitals: results of a retrospective patient record review study. *Qual Saf Health Care* 2009;18:297–302.
34 de Vries EN, Ramrattan MA, Smorenburg SM, *et al*. The incidence and nature of in-hospital adverse events: a systematic review. *Qual Saf Health Care* 2008;17:216–23.
35 Wears RL, Sutcliffe KM. *Still not safe: patient safety and the middle-managing of American medicine*. 1st edition. Oxford University Press, 2019.
36 World Health Organization (WHO). *Global patient safety action plan 2021-2030. Towards eliminating avoidable harm in health care. ISBN 978-92-4-003270-5 (electronic version)*. 2021.
37 Strandbygaard J, Dose N, Moeller KE, *et al*. Healthcare professionals' perception of safety culture and the operating room (OR) black box technology before clinical implementation: a cross-sectional survey. *BMJ Open Qual* 2022;11:e001819.
38 Norwegian Ministry of Health and Care Services. In Norwegian: Forskrift 28. Oktober 2016 NR. 1250 OM Ledelse Og Kvalitetsforbedring I Helse- Og Omsorgstjenesten. In English: regulation on management and quality improvement in the Healthcare services (the quality improvement regulation). FOR-2016-10-28-1250. 2016. Available: https://lovdata.no/dokument/SF/forskrift/2016-10-28-1250
39 Carlfjord S, Öhrn A, Gunnarsson A. Experiences from ten years of incident reporting in health care: a qualitative study among department managers and Coordinators. *BMC Health Serv Res* 2018;18:113.
40 Khatri N, Brown GD, Hicks LL. From a blame culture to a just culture in health care. *Health Care Manage Rev* 2009;34:312–22.
41 Levinson DR. *Hospital incident reporting systems do not capture most patient harm. Report no.OEI-06-09-00091*. Washington, DC: US Department of Health and Human Services, Office of the Inspector General, 2012.
42 Pham JC, Girard T, Pronovost PJ. What to do with healthcare incident reporting systems. *J Public Health Res* 2013;2:e27e27.
43 Mitchell I, Schuster A, Smith K, *et al*. Patient safety incident reporting: a qualitative study of thoughts and perceptions of experts 15 years after 'to err is human' *BMJ Qual Saf* 2016;25:92–9.
44 Macrae C. The problem with incident reporting. *BMJ Qual Saf* 2016;25:71–5.
45 Hewitt T, Chreim S, Forster A. Incident reporting systems: a comparative study of two hospital divisions. *Arch Public Health* 2016;74:34.
46 Office of the Auditor General of Norway (OAG). *Document 3:2 (2016–2017). In Norwegian: Undersøkelse av helseforetakenes håndtering av uønskede hendelser. Riksrevisjonen. In English: Investigation of the health enterprises handling of adverse events*. Office of the Auditor General of Norway, 2016.
47 Howell A-M, Burns EM, Hull L, *et al*. International recommendations for national patient safety incident reporting systems: an expert Delphi consensus-building process. *BMJ Qual Saf* 2017;26:150–63.
48 Macrae C, Stewart K. Can we import improvements from industry to healthcare? *BMJ* 2019;364:l1039.
49 The Norwegian Healthcare Investigation Board (NHIB; Ukom). *In Norwegian: Meldekultur og læring av uønskede pasienthendelser. Rapport, Ukom, 23.03.2023. In English: Reporting culture and learning from adverse events; patient injuries*.
50 Pham JC, Story JL, Hicks RW, *et al*. National study on the frequency, types, causes, and consequences of voluntarily reported emergency department medication errors. *J Emerg Med* 2011;40:485–92.
51 Healy JM, Davis KA, Pei KY. Comparison of internal medicine and general surgery residents' assessments of risk of postsurgical complications in surgically complex patients. *JAMA Surg* 2018;153:203.
52 Rodziewicz TL, Houseman B, Hipskind JE. Medical error reduction and prevention. In: *StatPearls [Internet]*. Treasure Island (FL): StatPearls Publishing, 2023.
53 Blaikie N. *Designing social research*. Cambridge: Polity Press, 2010.

54 Graneheim UH, Lundman B. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today* 2004;24:105–12.
55 Patton M. *Qualitative evaluation and research methods*. Beverly Hills, CA: Sage Publications, 1990.
56 Braun V, Clarke V. *Successful qualitative research - a practical guide for beginners*. Thousand Oaks, CA: Sage Publications, 2013.
57 Ritzer G, ed. *Encyclopedia of social theory*. Sage Publications, 2005.
58 Morgan DL. Qualitative content analysis: a guide to paths not taken. *Qual Health Res* 1993;3:112–21.
59 Hsieh H-F, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res* 2005;15:1277–88.
60 Lincoln SY, Guba EG. *Naturalistic inquiry*. Thousand Oaks, CA: Sage, 1985.
61 Graneheim UH, Lindgren B-M, Lundman B. Methodological challenges in qualitative content analysis: a discussion paper. *Nurse Educ Today* 2017;56:29–34.
62 Elo S, Kääriäinen M, Kanste O, *et al*. Qualitative content analysis: a focus on trustworthiness. *SAGE Open* 2014;4.
63 Malterud K, Siersma VD, Guassora AD. Sample size in qualitative interview studies: guided by information power. *Qual Health Res* 2016;26:1753–60.
64 Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care* 2007;19:349–57.
65 Koch T. Establishing rigour in qualitative research: the decision trail. *J Adv Nurs* 1994;19:976–86.
66 Vreugdenburg TD, Forel D, Marlow N, *et al*. Morbidity and mortality meetings: gold, silver or bronze? *ANZ J Surg* 2018;88:966–74.
67 Sinitsky DM, Gowda SB, Dawas K, *et al*. Morbidity and mortality meetings to improve patient safety: a survey of 109 consultant surgeons in London, United Kingdom. *Patient Saf Surg* 2019;13:27.
68 Alverdy JC. Surgical M&Amp;Amp;Ms need a scientific lexicon of "necessary and sufficient" In: *Bulletin of the American College of Surgeon*. 2023.
69 The Brigham and Women's Hospital. *Peer support*. Center for Professionalism and Peer Support (CPPS), 2013.
70 Canadian Patient Safety Institute (CPSI). *Creating a safe space*. Canadian Patient Safety Institute, 2020.
71 Royal College of Surgeons of England (RCS. *Supporting surgeons after adverse events. A Guide to good practice*. RCS England Professional and Clinical Standards, 2020.
72 Schrøder K, Bovil T, Jørgensen JS, *et al*. Evaluation of 'the buddy study', a peer support program for second victims in Healthcare: a survey in two Danish hospital departments. *BMC Health Serv Res* 2022;22:566.
73 Hollnagel E, Braithwaite J, RL W. *Resilient health care*. Farnham, Surrey: Ashgate Publishing Ltd, 2013.
74 Hollnagel E, Wears RL, Braithwaite J. *From Safety-I to Safety-II: A White Paper. The Resilient Health Care Net*. Published simultaneously by the University of Southern Denmark, University of Florida, USA, and Macquarie University, Australia, 2015. Available: http://resilienthealthcare.net/onewebmedia/WhitePaperFinal.pdf
75 Scott SD, Hirschinger LE, Cox KR, *et al*. The natural history of recovery for the Healthcare provider "second victim" after adverse patient events. *Qual Saf Health Care* 2009;18:325–30.
76 Sujan M. A safety-II perspective on organisational learning in Healthcare organisations comment on "false dawns and new horizons in patient safety research and practice" *Int J Health Policy Manag* 2018;7:662–6.
77 Verhagen MJ, de Vos MS, Sujan M, *et al*. The problem with making safety-II work in healthcare. *BMJ Qual Saf* 2022;31:402–8.
78 Woodier N, Burnett C, Moppett I. The value of learning from near misses to improve patient safety: a scoping review. *J Patient Saf* 2023;19:42–7.
79 Purdy AC, Smith BR, Amersi F, *et al*. Characteristics associated with outstanding general surgery residency graduate performance, as rated by surgical educators. *JAMA Surg* 2022;157:918–24.
80 Aggarwal R. Risk, complexity, decision making, and patient care. *JAMA Surg* 2018;153:208.
81 Hollnagel E. *Safety-II in practice. Developing the resilience potentials*. Routledge, 2018.
82 Mannion R, Braithwaite J. False dawns and new horizons in patient safety research and practice. *Int J Health Policy Manag* 2017;6:685–9.
83 Myers CG, Sutcliffe KM. High reliability organising in healthcare: still a long way left to go. *BMJ Qual Saf* 2022;31:845–8.
84 Taylor DJ, Goodwin D. Organisational failure: rethinking whistleblowing for tomorrow's doctors. *J Med Ethics* 2022. 10.1136/jme-2022-108328 [Epub ahead of print 8 Jun 2022].
85 Seys D, Scott S, Wu A, *et al*. Supporting involved health care professionals (second victims) following an adverse health event: a literature review. *Int J Nurs Stud* 2013;50:678–87.
86 Seys D, Wu AW, Van Gerven E, *et al*. Health care professionals as second victims after adverse events: a systematic review. *Eval Health Prof* 2013;36:135–62.
87 Shojania KG, Dixon-Woods M. 'Bad apples': time to redefine as a type of systems problem? *BMJ Qual Saf* 2013;22:528–31.
88 Tumelty M-E. The second victim: a contested term? *J Patient Saf* 2021;17:e1488–93.
89 Clarkson MD, Haskell H, Hemmelgarn C, *et al*. Abandon the term "second victim" *BMJ* 2019;364:l1233.
90 Øyri SF, Braut GS, Macrae C, *et al*. Hospital managers' perspectives with implementing quality improvement measures and a new regulatory framework: a qualitative case study. *BMJ Open* 2020;10:e042847.
91 Øyri SF, Wiig S. Linking resilience and regulation across system levels in healthcare - a multilevel study. *BMC Health Serv Res* 2022;22:510.
92 Norwegian Ministry of Education and Research (MER). *In Norwegian: Forskrift om nasjonal retningslinje for medisinutdanning. In English: Regulations for national guidelines related to medical education*. Kunnskapsdepartementet. Ministry of Education and Research, 2020.
93 Institute of Medicine (US) Committee on Quality of Health Care in America. *To err is human: building a safer health system*. National Academies Press (US), 2000.
94 Westbrook JI, Li L, Lehnbom EC, *et al*. What are incident reports telling us? A comparative study at two Australian hospitals of medication errors identified at audit, detected by staff and reported to an incident system. *Int J Qual Health Care* 2015;27:1–9.
95 Sujan MA, Huang H, Braithwaite J. Learning from incidents in health care: critique from a safety-II perspective. *Saf Sci* 2017;99:115–21.
96 Goekcimen K, Schwendimann R, Pfeiffer Y, *et al*. Addressing patient safety hazards using critical incident reporting in hospitals: a systematic review. *J Patient Saf* 2023;19:e1–8.
97 Waring JJ. Beyond blame: cultural barriers to medical incident reporting. *Soc Sci Med* 2005;60:1927–35.
98 Anderson JE, Kodate N, Walters R, *et al*. Can incident reporting improve safety? Healthcare practitioners' views of the effectiveness of incident reporting. *Int J Qual Health Care* 2013;25:141–50.
99 Amaral C, Sequeira C, Albacar-Riobóo N, *et al*. Patient safety training programs for health care professionals: a scoping review. *J Patient Saf* 2023;19:48–58.
100 World Health Organization (WHO). *Charter: health worker safety: a priority for patient safety*. World Health Organization, 2020. Available: https://apps.who.int/iris/handle/10665/339287
101 Hawkins RB, Nallamothu BK. Surgeons and systems working together to drive safety and quality. *BMJ Qual Saf* 2023;32:181–4.
102 Norwegian Directorate of Health (NDH). *In Norwegian: Veiledning av leger i spesialisering. In English: Supervision of medical doctors in residency*. Oslo: Helsedirektoratet, 2020. Available: https://www.helsedirektoratet.no/faglige-rad/veiledning-av-leger-i-spesialisering
103 Norwegian Directorate of Health (NDH). In: *In Norwegian: Ansettelse av helsepersonell. In English: Employment of health professionals*. Oslo: Helsedirektoratet, 2015. Available: https://www.helsedirektoratet.no/veiledere/ansettelse-av-helsepersonell
104 Pearse RM, Moreno RP, Bauer P, *et al*. Mortality after surgery in Europe: a 7 day cohort study. *Lancet* 2012;380:1059–65.
105 Norwegian Medical Association (NMA) (Den Norske Legeforening). In Norwegian: Antall Godkjente Spesialister per 14.04.2021. In English: the number of board-certified specialists PR. 14.04.2021. n.d. Available: https://www.legeforeningen.no/om-oss/legestatistikk/spesialister/
106 Norwegian Directorate of Health (NDH. *In Norwegian: Pasientskader i Norge 2021 - Målt med Global Trigger Tool. In English: Patient injuries in Norway 2021. Measured by Global Trigger Tool*. Oslo: Helsedirektoratet, 2021. Available: https://www.helsedirektoratet.no/rapporter/pasientskader-i-norge-2021-malt-med-global-trigger-tool