Perioperative quality of care and patient safety

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Chapter 3

Safety Culture

“The important question is not how to keep bad physicians from harming patients; it’s how to keep good physicians from harming patients.”

Complications. Atul Gawande 2002

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Anaesthesia is a high-risk field in medicine. In recent years anaesthesia has become more and more complex as advancements in science and technology have enabled anaesthesia for even the most complex and sick patients. Unsurprisingly, patient safety has become one of the most important aspects of modern anaesthetic practice. The art of striving for ultimate safety within the limits of available resources (such as time and personnel) is known as quality improvement. Quality improvement programmes have been shown to improve patient care and outcome. However, top down interventions implemented to improve patient safety as part of a quality improvement programme, will only be effective if the organisational culture embraces patient safety. For example, checklist, although proven to save lives will not aid in improving patient safety if they are not used correctly. It is therefore pivotal to not only implement safety initiatives, but also to address the safety culture within a healthcare organisation to improve patient outcome.

For clarification purposes it is important to differentiate the terms safety culture and safety climate as these terms are frequently used interchangeably. Safety culture is defined “as an aspect of an organisation’s culture, personified by the shared values, beliefs, norms, and procedures related to patient safety among members of an organisation, unit, or team. It influences clinician and staff behaviours, attitudes, and cognitions on the job.” Patient safety climate, however “provides a snapshot of clinician and staff perceptions about the observable, surface-level aspects of culture during a particular point in time.” The Dutch Institute for Healthcare evaluated the safety culture in Dutch hospitals in 2007 and 2012 and found an improvement in 2012 compared to 2007. However, little is known about safety cultures within different anaesthesia departments in the Netherlands and considerable variation between these cultures is likely. It is therefore requisite to perform a local assessment of the patient safety culture to enhance patient safety within a department. In 2014 we initiated a quality improvement programme in our anaesthetic department. The main aim of this project was to get an insight in the current patient safety culture within our department in order to improve it. To this end, we used the Instrument for Self-Evaluation of
the Patient safety culture (ISEP) from the organisation of Dutch Healthcare Research. We aimed to improve the patient safety culture in our department so that 80% of staff would perceive the safety culture as proactive or generative after two years.

Methods

This study was reported according to the SQUIRE 2.0 guideline. The institutional ethical review board waived the requirement for informed consent.

Setting:
Our department performs about 27,000 anaesthetic interventions per year. In the department there are 239 members of staff; 56 anaesthesiologists, 58 trainees, 71 anaesthesia practitioners (AP), 39 recovery nurses, 6 members of the pain team (nurses and a psychologist), as well as 8 outpatient clinic staff. There are 25 operating theatres (2 hybrid), 2 interventional radiology suites, 3 cardiac catheterisation laboratories and 3 endoscopy suites. In the Dutch system, one anaesthesiologist sometimes manages two anaesthetic (low risk) programmes in adjacent operating theatres with the help of an AP and sometimes a resident who are assigned to a single theatre. Anaesthesia Practitioners have completed a 3-year fulltime graduate training programme. They support the anaesthesiologist in providing anaesthesia, life support or pain relief in the operating and emergency room and on the obstetric ward. They are trained in Advanced Life Support, have airway skills, and are certified to give certain drugs to the patient during anaesthesia under indirect supervision of an anaesthesiologist. Recovery nurses are certified nurses with additional training in immediate postoperative care. They are either qualified to care for low complex cases or, with additional training and certification, qualified to care for patients on the medium or high care postoperative unit; the Post Anaesthetic Care Unit (PACU). Patients on the PACU can be ventilated, dialysed and stay for up to 24-48 hours (i.e. kidney transplant, brain surgery, complex vascular, liver, endocrine or gastroenterological operations). The pain team is divided in multidisciplinary staff for acute (early postoperative) or chronic pain. The chronic pain team treats patients on an outpatient basis and is responsible for patients with chronic pain admitted to the hospital.

Interventions:
Late 2013 we instituted a Patient Safety Board Anaesthesia (PSB-A) to coordinate the quality improvement programme within the department. This board consisted of 4 anaesthesiologists, 4 anaesthesia residents, 4 APs, 3 recovery nurses, 1 psychologist specialised in the psychological treatment of chronic pain patients, 1 out-patient clinic nurse and 1 secretary, who was also a departmental manager. In order to target the direction of cultural changes that were needed to improve the patient safety culture an initial assessment of the patient safety
climate was carried out. Identified safety issues revealed by this assessment were addressed. Members of the PSB-A reached out to other members of staff to get more people involved and to create support for policy changes and new working methods. Small groups of staff were made responsible for resolving specific issues and were asked to report progress. The PSB-A approved and implemented solutions for the respective problems. The implemented actions were presented at quarterly departmental meetings and by email notifications.

**ISEP instrument:**
The Institute for Dutch Healthcare Research has developed two instruments, the Dutch hospital survey on patient safety culture\(^{16,17}\) and the ISEP instrument\(^{14}\) to assess the safety culture in a healthcare organisation. They are based on the instruments developed by Oil Company Shell E&P to assess the safety culture within an industrial organisation\(^{18,19}\) and the Hospital Survey on patient safety by the Agency for Healthcare Research and Quality.\(^{20-22}\) We used the ISEP instrument\(^{14}\) to assess the patient safety culture within our department as it enables both reviewing of safety culture within an organisation as well as management on a cultural level. It describes eight dimensions to manage patient safety: 1. Priority and responsibility of patient safety, 2. incident reporting, 3. resource allocation, 4. communication, 5. teamwork, 6. personnel, 7. competency and 8. compliance.\(^{11,14}\) For every dimension there are 5 cultural levels of safety: pathological, reactive, calculative, proactive and generative\(^{11,14,17}\) (tables 3.1 and 3.2). The instrument consists of twenty-seven questions about the different dimensions. Three questions for dimension 1, 2, 3, 4 and 7 and four questions for dimension 5, 6 and 8. Each question is answered by the respondents with a statement that corresponds to one of the five levels of cultural safety.\(^{11}\) All members of our anaesthetic department; anaesthetists, anaesthesia residents, APs, departmental management, recovery staff and outpatient clinic staff of both the preassessment as the pain clinics received an electronic copy of the instrument\(^{11}\) and were asked to complete the survey anonymously. If a member of staff indicated that there were two levels of cultural safety that they felt were applicable to the question, i.e. this person felt that there were two levels of safety that corresponded to that dimension, the highest level of cultural safety was used in the analysis.

The ISEP instrument\(^{14}\) used for this study is a quality assessment instrument and not a meter; the primary goal of this instrument is to exemplify the patient safety culture within a department in order to stimulate debate and to facilitate improvement initiatives. The validity of this instrument can therefore not be expressed in a measure. However, the instrument was tested in a study which demonstrated face validity for the instrument.\(^{14}\) No statistical analysis was performed for the same reason. Descriptive data were used to express scores for all dimensions.
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Results

Initial assessment
Response rate for the initial assessment was 111/210 (53%). Thirty-three (29.7%) were anaesthetists; 28 (25.2%) anaesthesia residents; 24 (21.6%) anaesthesia practitioners; 18 (16.2%) recovery staff; 5 (4.5%) staff Pain Service; 2 (1.1%) outpatient staff of the preassessment clinic and 1 (0.9%) secretary. The response rate per group was 59%, 41%, 34%, 46%, 83%, 25% and 25% respectively. Staff were also asked if they had any particular safety issues that they would like to see addressed or that they were concerned about in any way.

Identified deficits
The issues that were identified by the survey were, the risk of patients falling from the operating table (dimension 1). The feeling that not enough was done with reported incidents, or at least that the communication about actions that were taken after analysis of incidents was insufficient (dimension 2). That there was a need for additional fibre-optic scopes, improvement in availability of difficult airway trolleys, an ultrasound machine in the holding area for peripheral nerve blocks and optimisation of getting blood (particularly the massive transfusion packs) to the operating theatre outside of day-hours (dimension 3). Furthermore, that handover of postoperative patients to recovery staff needed to be improved (dimension 4).

Table 3.1 Dimensions of Safety Culture as described by van Struben et al.14

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Description</th>
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<tbody>
<tr>
<td>1. Priority and responsibility of</td>
<td>How important is patient safety within the department? How aware are healthcare professionals of risks for patients?</td>
</tr>
<tr>
<td>patient safety</td>
<td>What has been done to optimise patient safety? Who is deemed responsible for patient safety? Who or what is deemed responsible for incidents and near misses? How is this managed?</td>
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<tr>
<td>2. Incident reporting</td>
<td>Is there an Incident Reporting System? What is the culture of reporting incidents and near misses? What is done with reports?</td>
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<tr>
<td>3. Resource allocation</td>
<td>How much importance is given to selection/adjustment of materials, equipment, workspaces when patient safety is considered</td>
</tr>
<tr>
<td>4. Communication</td>
<td>What is the communication like around incidents? What is the communication like between healthcare professionals within the department and with managers, patients, family and themselves?</td>
</tr>
<tr>
<td>5. Teamwork</td>
<td>Is there a sense of teamwork within the department? Is there enough communication and evaluation? Are healthcare professionals trained to work as a team?</td>
</tr>
<tr>
<td>6. Personnel</td>
<td>What is done in terms of personnel policy/deployment of staff to optimise patient safety? Are healthcare professionals’ performances evaluated?</td>
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<tr>
<td>7. Competency</td>
<td>Is patient safety an issue in training of healthcare professionals and managers?</td>
</tr>
<tr>
<td>8. Compliance</td>
<td>Culture of learning from mistakes? Are appropriate changes implemented and evaluated after an incident?</td>
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Some members of staff reported that they still experienced hierarchy and therefore found it difficult to address safety issues. Staff experienced negative reactions when safety issues where pointed out to colleagues (dimension 5). It was mentioned that there was a problem with availability of anaesthesiologists between 16.00 and 20.00 hours for patients in the PACU, as on-call staff was usually very busy with on-going theatre cases or emergencies (dimension 6). And finally, a number of staff also indicated that there was a pathological culture regarding competencies. This was mainly caused by concerns regarding suboptimal performance of individual colleagues on occasion (dimension 7). There were no concrete issues stated for dimension 8 ‘compliance’. These identified issues were target after this assessment. Implemented actions per dimension can be found in table 3.3.

**Re-evaluation**

After targeting the identified deficits of the first assessment we re-evaluated our safety culture by sending the same instrument to all members of our anaesthesia department. This was 2 years after the first questionnaire. Again, the questionnaire could be filled in anonymously. Response rate was 100/239 (41.8%). Thirty (30%) were anaesthetists; 25 (25%) anaesthesia residents; 27 (27%) anaesthesia practitioners; 13 (13%) recovery staff; 4 (4%) Staff from the Pain Service and 1 (1%) outpatient staff of the preassessment clinic. Figure 3.1 shows all scores for 2014 and 2016 per dimension. There was a decrease in number of staff perceiving a reactive culture and an increase over all domains in the percentage of staff perceiving either a proactive or generative safety culture in 2016 (table 3.4). Although there was an increase in the percentage of staff perceiving a proactive or generative culture over all domains, the aim of a total percentage of at least 80% of staff perceiving a proactive or generative culture was not attained for all domains.
Table 3.3 Implemented actions on the basis of identified deficits per dimension

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Implemented actions</th>
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</thead>
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| Priority and responsibility of patient safety | - institution of a PSB-A  
- improvement of logistics and responsibilities around preassessment of patients  
- development and implementation of Emergency Manuals to improve the management of emergencies  
- improvement in fixation materials to prevent falls from the operating table |
| incident reporting               | - simplifying method to register incidents in the data management system  
- regular feedback about incidents and their learning points through meetings and emails (see also “communication”)  
- training staff for incident analysis (Tripod Beta Analysis)[23] |
| resource allocation              | - improved availability of difficult airway trolleys  
- Defibrillators with pacing function on the recovery area (also available for theatres)  
- more fibre optic scopes  
- standardised medication labels with QR code for electronic double check  
- ultrasound machine always available in the holding area for peripheral nerve blocks |
| communication                    | - improving handover to PACU with SBAR[24,25] structure and pocket size cognitive aid  
- anaesthetic practitioner is allowed to do handover in case the responsible anaesthetist is unavailable  
- weekly departmental meeting discussing reported incidents  
- regular email notifications about frequent or important incidents  
- rapid sequence induction checklist |
| teamwork                         | - start in the operating theatre 10 minutes earlier to discuss issues of that day within whole team  
- care-for-our-own support group for issues (either work-related or personal) that people want to address |
| Personnel                        | - Institution of PACU shift for anaesthesiologist (10.30-20.00 h) |
| Competency                       | - fit-to-fly for personnel (measurable set of competencies for anaesthesiologists)  
- induction week for senior residents before they start senior on call shifts  
- yearly high-fidelity simulation training  
- institution of “Personal Development Plan” for staff which is discussed at annual appraisal |
| Compliance                       | - No intervention |

Table 3.4 Percentage of staff perceiving a proactive or generative safety climate

<table>
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<tr>
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<th>2014</th>
<th>2016</th>
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<tbody>
<tr>
<td>1. priority and responsibility of patient safety</td>
<td>68.2</td>
<td>79.1</td>
</tr>
<tr>
<td>2. incident reporting</td>
<td>80.2</td>
<td>84.1</td>
</tr>
<tr>
<td>3. resource allocation</td>
<td>60.9</td>
<td>70.5</td>
</tr>
<tr>
<td>4. communication</td>
<td>43.6</td>
<td>51.2</td>
</tr>
<tr>
<td>5. teamwork</td>
<td>52.5</td>
<td>59.7</td>
</tr>
<tr>
<td>6. personnel</td>
<td>60.5</td>
<td>58.5</td>
</tr>
<tr>
<td>7. competency</td>
<td>35</td>
<td>41</td>
</tr>
<tr>
<td>8. compliance</td>
<td>55.5</td>
<td>57.1</td>
</tr>
</tbody>
</table>
Overall, we saw an improvement in the patient safety culture over all dimensions. Although all identified patient safety issues were targeted and all staff was encouraged to be involved in this process, we did not attain our goal of a perceived proactive or generative safety culture.

**Figure 3.1** Overall change in perceived safety climate.

Histograms depicting percentages of staff perceiving different cultural levels in patient safety within the department. White bars represent safety climate in 2014, black bars represent safety climate in 2016. See tables 3.1, 3.2 for a description of all dimension and safety levels.

**Discussion**

Overall, we saw an improvement in the patient safety culture over all dimensions. Although all identified patient safety issues were targeted and all staff was encouraged to be involved in this process, we did not attain our goal of a perceived proactive or generative safety culture.
by 80% of staff for all dimensions. The increased percentage of staff perceiving a proactive or generative safety culture in all dimensions, however, reflects engagement and awareness of staff with safety issues in the department. Actively involving staff in the quality improvement process will have a big impact on advancements in both patient safety culture and quality of care. It augments the proactive identification of hazards for patients by members of staff. As policy makers are not always involved in direct patient care, it is essential to have input from all staff to improve quality of care. Ultimately, the involvement of staff will also be the only way to change the patient safety culture within a department. The reason that the target of a perceived proactive or generative safety climate by 80% of staff for all dimensions was not attained could be because cultural changes are known to evolve slowly. Two years might not have been enough time to fully appreciate the improvement in safety culture secondary to our implemented measures.

A limitation of this work is that the results of this study are not directly generalisable. As discussed previously, the instrument used is a quality assessment instrument and not a meter. So, percentages and interventions will not be directly transferable to other departments. However, this study shows how an assessment of the patient safety culture can be carried out in an anaesthetic department. Despite all efforts to engage staff in the project, the response rates of 53% and 41.8% reflect the voluntary nature of staff to participate in the study. This could have induced the possibility of selection bias, as more safety-engaged personnel is likely to be engaged. This response rate also points out that we need to improve participation of staff in projects like this. Motivation of staff to support and participate is an important facilitator in quality improvement. We also need to address conditions like willingness and ability of staff to realise change in order to continue to improve the safety culture within our department.

**Conclusion**

With our interventions we observed an increase in the percentage of staff perceiving the safety climate as proactive or generative. Performing an assessment of safety culture within a department can reveal and help target specific deficits within this culture. It also increases awareness of patient safety issues amongst staff. This study describes a method by which the safety culture can be assessed, and quality improvement measures can be implemented. Further research should focus on the impact of patient safety culture on patient outcomes.
References

7. Sexton JB. A Matter of Life or Death: Social, Psychological, and Organizational Factors Related to Patient Outcomes in the Intensive Care Unit. Austin: Univ of Texas; 2002


25. SBAR Technique for Communication: A Situational Briefing Model [http://www.ihi.org/resources/Pages/Tools/SBARTechniqueforCommunicationASituationalBriefingModel.aspx (last accessed 30-3-2019)]