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QUALITY AND PATIENT SAFETY

Perception of patient safety differs by clinical area and discipline

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Editor's key points

- Perception of patient safety is an important component of organizational structure essential to quality improvement, but is complex and difficult to study.
- This study examined the influence of environment (operating theatre or intensive care unit) and discipline on organizational factors (latent risk factors) in four university hospitals using a new survey instrument.
- Differences in perceptions of patient safety between various clinical areas and disciplines are important considerations in designing measures to improve safety.

Background. Current thinking about patient safety emphasizes the relationship between organizational factors, that is, latent risk factors (LRFs) and patient safety. This study explores the influence of the operating theatre (OT), intensive care unit (ICU), and disciplines on ratings of LRFs. If we have an understanding of the contribution made by these factors, we can identify significant points from which we can promote a safe environment.

Methods. Staff in four university hospitals were sent a survey relating to the state of LRFs, which included communication, planning and coordination, design, maintenance, equipment, teamwork, team instructions, housekeeping, situational awareness, hierarchy, and procedures.

Results. The ICU staff had more favourable perceptions of training, communication, team instruction, and hierarchy. The OT staff had more favourable perceptions of technical LRFs. We found three profiles for disciplines: (i) anaesthetists and intensivists had more favourable perceptions of technical LRFs than surgeons and nurses. (ii) Anaesthetists, anaesthesia nurse-technicians, and recovery nurses had a poorer perception of non-technical skills. (iii) Anaesthesia nurse-technicians and recovery nurses had less favourable perceptions of procedures, housekeeping, and situational awareness than anaesthetists and intensivists.

Conclusions. As healthcare focuses its safety efforts towards system issues rather than towards the individual provider of care, attention has turned to organizational factors, known as LRFs. Understanding how LRFs affect safety should enable us to design more effective measures that will improve overall safety. Strategies for improving patient safety should be tailored specifically for various clinical areas and disciplines.

Keywords: intensive care unit; operating theatre; patient safety; personnel

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Safety in hospitals and complex environments such as the operating theatre (OT) and the intensive care unit (ICU) rely on multiple system defences such as organizational structure, protocols, training received by professionals, and the quality of equipment or technology. Of particular interest are how medical errors occur, how they can be addressed within the healthcare system, and how the work environment affects medical errors and near misses. There is increasing acceptance of the idea that adverse outcomes are often due to system failures, whereby deficiencies at many different levels create the context in which human error can have a negative impact.[1–3] Organizational factors that contribute errors and to safety can be grouped together into a limited number of general failure classes or latent risk factors (LRFs). LRFs are error-producing conditions such as poor design, maintenance failures, unworkable procedures, deficiencies in training, equipment design and use, and poor team coordination.[4] Safety experts argue that proactively reducing such LRFs will result in the delivery of safer care more quickly than taking measures directed, often reactively, at specific providers of care.

Patient safety varies across institutions, within institutions, and between disciplines.[5–9] One dimension along which it can vary is the clinical area, such as the OT or ICU. A proactive system approach to patient safety suggests that it is necessary to study all aspects of the system that comprises an operation or ICU hospitalization.[10 11] Most studies focus on the impact of a limited set of factors, for instance, either

teamwork,[6] work procedures,[12] or communication.[13] Consequently, little is known about the relative importance of each when studied simultaneously.

Anaesthetists do not work independently from others and their performance is embedded in organizational factors. Different disciplines in the OT can have different work norms and the pace of their work can vary.[14] Surgeons, anaesthetists, and critical care physicians seem more satisfied with physician–nurse collaboration than nurses.[15 16] Nurses are less likely to agree that they were provided with adequate training to do the job than surgeons.[17] Physicians' views about the contribution of guidelines to safety and to clinical practice differs from those of nurses.[17–20] Thus, it would be likely that interdisciplinary differences may exist in the perception of patient safety.

The aim of the present study was to test for differences in perceptions of LRFs and to explore the contribution of disciplines and clinical area (OT and ICU). Identification of differences between clinical area and disciplines allow measures aimed at LRFs that are below standard to be specifically tailored. Tailoring is necessary because correction of the various LRFs would require entirely different preventive actions.[21] The advantage of identifying these differences is the ability to address these issues in a safety management programme.

Methods

Sample and procedure

The study was approved by the local Research Ethics Board. We chose to investigate the OT and ICU clinical areas. Both the OT and the ICU are dynamic environments where there is a wide variety of high-technology equipment, constant change, and time stress where there is a considerable risk of error. The study was performed at four OTs and two ICUs in four university hospitals in The Netherlands. We asked hospitals, where another safety programme was currently implemented, to participate in a safety programme. That is why two ICUs were incorporated in the study. Clinicians, trainees, and nursing staff were included in the study, if they had been in their job for more than 3 months. Disciplines included anaesthetists, anaesthesia nurse-technicians (anaesthesia N-Ts), recovery nurses, surgeons, theatre nurses, intensivists, intensive care nurses (IC nurses), and trainee anaesthesia nurse-technicians/theatre nurses (trainee A-T nurses).

Baseline characteristics

The following four patient characteristic variables were used as control variables: gender (1, male; 2, female), age (in years), working hours (contractual hours per week), and length of service in the job (1, <1 yr; 2, 1–5 yr; 3, 6–10 yr; 4, >10).

Survey instrument

The approach taken to assessing the state of individual LRFs is analogous to a health check, which measures a limited number of well-chosen diagnostic vital signs. Items, presented as statements, can be indicators of either potential problems or good practice.

In the current study, LRFs were measured using the Leiden Operating Theatre & Intensive Care Safety (LOTICS) scale, which has been validated with respect to factorial structure and reliability, and also its content and discriminative validity.[22] It measures 12 LRFs with a total of 55 indicator questions: training, task-related communication, planning and coordination, design, maintenance, equipment resources, teamwork, team instruction, housekeeping, situational awareness, hierarchy, and procedures. Items, presented as statements, were indicators of either potential problems or good practice (Appendix). Respondents indicated the extent to which they agreed with each statement on a four-point scale (1, disagree completely; 4, agree completely). Higher scores indicated more favourable perceptions about working conditions.

Statistical analyses

The returned questionnaires were analysed using SPSS® version 17 (Chicago, IL, USA). For all LRFs, negatively formulated items were recoded so that a higher score always indicates more favourable perceptions of that LRF. Scale scores were generated by averaging the ratings of all items that were part of the scale. To calculate the percentage frequency of responses to each item, responses of agree completely and agree were combined, as were those of disagree completely and disagree.

The study sample was divided according to clinical area (OT or ICU) and according to disciplines. One-way analyses of variance (ANOVAs) were used to compare the mean scores and baseline characteristics (age, working hours, and current years in the job). χ^2 tests were used to compare the mean scores across discipline for gender.

To test for differences in perceptions of LRFs by clinical area and discipline, we used ANOVA. As there were differences in age, working hours, and length of service in the job, they were used as covariates. The Pearson correlation coefficients were calculated to examine the pattern of relationships between LRFs and clinical area and discipline.

Results

The overall response rate was 64% (768 out of 1260 questionnaires). The response rate ranged by hospital (62–65%), by clinical area (62–68%), and by discipline (62–69%). Respondents were predominantly female 71% with a mean age of 40.3 ($F_{3,760}=8.71$, $P<0.0001$). Respondents had been in their job on average for more than 8 yr (mean 2.77, $F_{3,760}=2.97$, $P=0.019$). Respondents worked on average 33.1 h a week ($F_{3,760}=8.97$, $P=0.000$). Significant differences between disciplines were found in age, working hours, length of service in the job, and gender (Table 1).

Respondent characteristics and LRFs

We compared patient characteristic variables with LRFs. There was a significant difference for age with the design