Variations in hospital worker perceptions of safety culture

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Abstract

Objective. To compare the attitudes toward and perceptions of institutional practices that can influence patient safety between all professional groups at a university medical center.

Design. A questionnaire measuring nine dimensions of organizational and safety culture was distributed to all hospital workers. Each item was rated on a 1 (‘strongly disagree’) to 5 (‘strongly agree’) scale.

Participants. Professionals (2995), grouped as ‘physicians’ (16.6%), ‘nurses’ (40.3%), ‘clinical workers’ (e.g. psychologists; 21.7%), ‘laboratory workers’ (e.g. technicians; 11%) and ‘non-medical workers’ (e.g. managers; 10.4%).

Main outcome measures. One-way analysis of variances (ANOVAs) carried out separately on each dimension with professional group as the independent variable of interest.

Results. Differences in ratings of organizational and safety culture were found across professional groups. Physicians and non-medical workers tended to rate the dimensions of organizational and safety culture more positively than did nurses, clinical workers and laboratory workers. For example, physicians gave more positive ratings of ‘institutional commitment to safety’ than did nurses, clinical workers and laboratory workers (mean = 3.71 vs. 3.62, 3.61 and 3.58, respectively, P < 0.01) and non-medical workers gave more positive ratings than did physicians, nurses, clinical workers and laboratory workers to ‘perceptions towards the hospital’ (mean = 3.69 vs. 3.39, 3.36, 3.49 and 3.47, respectively, P < 0.001).

Conclusions. Interventions to promote safety culture should be tailored to the target group as attitudes and perceptions may differ among groups.

Keywords: patient safety, safety culture, organizational culture, survey, health care

Introduction

The implementation of institutional safeguards to enhance patient safety has become a major focus of health-care organizations, especially since the landmark reports of the Institute of Medicine (IOM) in 1999–2001 [1, 2]. The IOM estimated that 44 000–98 000 people in the United States alone die in hospitals each year because of preventable medical errors, making medical errors the eighth leading cause of death [1, 2]. Importantly, the IOM pinpointed failed systems and procedures, and not simply the negligence of health-care workers, as the cause of 90% of these deaths. The 2004 IOM report [3] makes the point that a culture that encourages the sharing rather than the hiding of errors and near misses is needed to promote patient safety. Such a shift from a culture in which workers are discouraged from reporting errors to one in which they are encouraged to report errors or failures may be accomplished by stopping the practice of focusing blame on the health-care workers at the ‘sharp-end’ and focusing instead on processes and procedures to improve patient safety that cut across individual units or hospital functions [4].

Improving patient safety requires the institution of an organizational culture that supports patient safety, or, ‘safety culture’ [5]. The safety culture of a hospital can be defined as the compilation of hospital workers’ attitudes, beliefs, perceptions and assumptions toward organizational practices that directly or indirectly influence patient safety [6]. Characteristics of a strong safety culture include a commitment of hospital management to promote and protect error reporting and to use the reports for safety improvement, a commitment of leaders to flatten hierarchies by, for example, decentralizing authority for each unit [7], and, especially, a commitment of all hospital workers—ranging from the managers, administrative workers, laboratory workers and so forth, who have limited contact with patients to nurses and...
surgeons and so forth, who come into direct contact with patients regularly—to make patient safety the main priority.

Variations in safety culture, such as between ICU units [8] or between clinicians and senior managers [9], may compromise patient safety because variations in safety culture may lead to unmet expectations and communication breakdowns [8, 10]. Understanding how different groups perceive safety culture is thus an important step in determining what and for whom institutional safeguards should be implemented to enhance patient safety. Assessment of attitudes, values and perceptions toward organizational practices known to promote safety culture can be seen as a tool for identifying problematic areas with regard to patient safety [11, 12]. Information gained by assessing safety-related perceptions or attitudes can be used by hospital leaders to design institutional safeguards or educational programs to improve safety culture, such as assertiveness training for nurses who find speaking up difficult [12–14]. Few prior studies have compared perceptions of safety culture variables of all professional groups within a hospital [10, 14, 15]. The current study thus aims to gain insight into institutional practices with regard to patient safety from all professional groups within a large university medical center in the Netherlands in order to identify areas for improvement.

**Methods**

**Setting**

The study was conducted in the University Medical Center Groningen (UMCG) in the Netherlands, a hospital with ~1300 beds including 53 surgical and medical adult intensive-care beds, and 46 neonatal and pediatric intensive-care beds. The UMCG is the only university medical center in the northern part of the country. Therefore, it is the major hospital of referral for patients with many types of illness and is an important center for all organ transplants.

**Participants**

From April to June 2009, invitations to participate in the survey study were sent electronically to all 5609 employees (including part-timers) of the UMCG on the basis of employment records using hospital email addresses. The groups of interest were physicians and physician assistants, medical specialists (e.g. oncologists), nurses (nurses in all departments at the UMCG including Intensive Care, Emergency and Surgical Departments), laboratory workers (e.g. laboratory technologists and technicians), clinical consultants (e.g. dieticians, psychologists and pharmacists), clinical support workers (e.g. pharmacist assistants, perfusionists and biologists), facility management workers, secretarial and administrative workers, research and teaching assistants, and managers (i.e. non-medical heads of department whose main task is to ensure business continuity).

For the purposes of analysis, medical specialists, physicians and physician assistants were treated as one professional group (‘physicians’). Nurses were treated as one professional group regardless of department (‘nurses’). Similarly, clinical consultants and clinical support workers were both considered to be ‘clinical workers’. Facility management workers, secretarial and administrative workers, research and teaching assistants, and managers were included in the group ‘non-medical workers’ because these workers did not have direct contact with patients and the number of workers in each group was too small to be analyzed separately. Members of any professional group were considered to hold an executive function if they led a sector, department, unit, sub-unit or clinic and were involved directly in organizational decision making or policy making.

Participation was on a voluntary basis and informed consent was given by respondents. The questionnaire was filled in online and anonymously. Responses were thus confidential. Anonymity was ensured by treating the responses to the demographic questions (other than professional group) separately from the questionnaire responses. The Medical Ethical Testing Committee of the University of Groningen waives Institutional Research Board approval for anonymous questionnaires conducted under personnel.

**Instrument**

The questionnaire was created by a professional testing center with experience measuring organizational and safety culture variables. The decision was made to create the questionnaire by adapting questions from existing questionnaires [12, 16] and literature [17–21] in order to cover the range of topics in which the organization was interested with a reasonable number of questions. The questionnaire consisted of 99 items representing nine dimensions of safety and organizational culture and an additional five demographic questions (professional group, gender, age group, years of working in the hospital and executive or non-executive function).

Table 1 gives an overview of the dimensions and sample items within each dimension. The dimensions ‘institutional commitment to safety’ and ‘teamwork climate’ were nearly identical to the dimensions ‘safety climate’ and ‘teamwork climate’, respectively, of the Safety Attitudes Questionnaire (SAQ) Intensive Care Unit-version [12]. The items were adapted so that they were not specific to any particular departmental context (e.g. ‘High levels of workload are common in this ICU’ was adapted to read ‘High levels of workload are common in my department’) and one item from the safety climate dimension (‘Briefings (e.g. morning briefings and pre- and post-operative briefings) are important for patient safety’) was replaced by ‘My team pays much attention to patient aftercare and handoffs’ in the dimension institutional commitment to safety. Of the other SAQ dimensions (i.e. ‘job satisfaction’, ‘perceptions of management’ and ‘working conditions’), only ‘stress recognition’ was not represented in our questionnaire. All items were phrased as statements and rated according to the amount of agreement or disagreement ranging from 1 (strongly disagree) to 5 (strongly agree).
Table 1  Overview of safety and organizational culture dimensions and sample items

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Sample items</th>
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<tr>
<td>Institutional commitment to safety (8 items): perceptions of a strong and proactive organizational commitment to safety.</td>
<td>‘I would feel safe being treated here as a patient’, ‘The culture in my department makes it easy to learn from the errors of others’. ‘Disagreements in the department here are resolved appropriately (i.e. not who is right but what is best for the patient)’, ‘The physicians and nurses here work together as a well-coordinated team’.</td>
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<td>Teamwork climate (6 items): perceived quality of collaboration between hospital workers in delivering patient care.</td>
<td>‘My team delivers high quality results’, ‘I experience good teamwork between different teams’. ‘I enjoy my work’, ‘I have sufficient opportunities to carry out tasks that I am good at doing’. ‘I am satisfied with my working hours’, ‘I am equipped with appropriate instruments and materials to carry out my work’.</td>
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<td>Team performance (12 items): perceived quality of team performance.</td>
<td>‘I have pleasant colleagues’, ‘I am motivated by my colleagues’. ‘My supervisors give clear objectives’, ‘I receive sufficient feedback from my supervisors’. ‘I am proud of the hospital’, ‘I support the objectives of the hospital’. ‘At work, I can gain new knowledge sufficiently’, ‘I have opportunities to develop my career in this hospital’.</td>
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<td>Work satisfaction (16 items): positivity about work experiences.</td>
<td>‘I am satisfied with my working hours’, ‘I am equipped with appropriate instruments and materials to carry out my work’. ‘I experience good teamwork between different teams’. ‘I enjoy my work’, ‘I have sufficient opportunities to carry out tasks that I am good at doing’. ‘I am satisfied with my working hours’, ‘I am equipped with appropriate instruments and materials to carry out my work’.</td>
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<td>Working conditions (10 items): perceived quality of work environment and logistical support (e.g. schedules, workload and equipment).</td>
<td>‘I have pleasant colleagues’, ‘I am motivated by my colleagues’. ‘My supervisors give clear objectives’, ‘I receive sufficient feedback from my supervisors’. ‘I am proud of the hospital’, ‘I support the objectives of the hospital’. ‘At work, I can gain new knowledge sufficiently’, ‘I have opportunities to develop my career in this hospital’.</td>
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<tr>
<td>Colleagiality (8 items): perceived quality of collegial atmosphere.</td>
<td>‘I have pleasant colleagues’, ‘I am motivated by my colleagues’. ‘My supervisors give clear objectives’, ‘I receive sufficient feedback from my supervisors’. ‘I am proud of the hospital’, ‘I support the objectives of the hospital’. ‘At work, I can gain new knowledge sufficiently’, ‘I have opportunities to develop my career in this hospital’.</td>
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<tr>
<td>Relations with supervisors (13 items): perceived quality of supervision.</td>
<td>‘I have pleasant colleagues’, ‘I am motivated by my colleagues’. ‘My supervisors give clear objectives’, ‘I receive sufficient feedback from my supervisors’. ‘I am proud of the hospital’, ‘I support the objectives of the hospital’. ‘At work, I can gain new knowledge sufficiently’, ‘I have opportunities to develop my career in this hospital’.</td>
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<tr>
<td>Perceptions toward the hospital (17 items): perceptions toward the organization’s objectives, structures and practices.</td>
<td>‘I would feel safe being treated here as a patient’, ‘The culture in my department makes it easy to learn from the errors of others’. ‘Disagreements in the department here are resolved appropriately (i.e. not who is right but what is best for the patient)’, ‘The physicians and nurses here work together as a well-coordinated team’.</td>
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<td>Career perspectives (9 items): perceived quality of self-development and career perspectives.</td>
<td>‘I would feel safe being treated here as a patient’, ‘The culture in my department makes it easy to learn from the errors of others’. ‘Disagreements in the department here are resolved appropriately (i.e. not who is right but what is best for the patient)’, ‘The physicians and nurses here work together as a well-coordinated team’.</td>
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Cronbach’s α calculated for each dimension revealed acceptable levels of reliability for each dimension (Cronbach’s α = 0.82 for institutional commitment to safety, 0.80 for teamwork climate, 0.88 for team performance, 0.87 for work satisfaction, 0.71 for working conditions, 0.89 for collegiality, 0.95 for relations with supervisors, 0.91 for perceptions toward the hospital and 0.81 for career perspectives).

Data analysis

Scores on each of the dimensions were computed by averaging the ratings for the items within a dimension. Scores for the five professional groups (physicians, nurses, clinical workers, laboratory workers and non-medical workers) were compared for each dimension using one-way analysis of variances (ANOVAs). Because of the need to preserve the anonymity of the respondents, it was not possible to couple demographic information to questionnaire responses. Pearson correlation coefficients were computed between all dimensions. A significance level of $P < 0.05$ was used for all analyses. Bonferroni correction was used for pairwise comparisons between professional groups within each dimension.

Results

Out of 5609 invitations sent, 2995 employees filled out the questionnaire (response rate 53.4%). Non-medical workers ($n = 311$) had the highest response rate (67.5%) followed by nurses ($n = 1208$, response rate 58.1%), clinical workers ($n = 649$, response rate 56.1%), laboratory workers ($n = 331$, response rate 51.0%) and physicians ($n = 496$, response rate 46.5%). The majority of the participants were female (72.2%). Five age groups were used as response categories: 15–24 years old (4.1% of the respondents), 25–34 years old (28.6%), 35–44 years old (24.5%), 45–54 years old (28.6%) and >54 years old (14.2%). Time spent working in the hospital was categorized as <5 years (35.4%), 5–9 years (27.5%), 10–20 years (9.8%) or >20 years (17.3%). Only 5.6% of respondents had an executive function.

The mean scores for all dimensions were higher than 3 (the neutral point) out of 5 possible points, implying that, in general, perceptions of organizational and safety culture were positive. Although most differences were small, significant differences between professional groups were found for all dimensions except for ‘team performance’ (see Table 2). Physicians and non-medical workers tended to rate the dimensions of organizational and safety culture more positively than did nurses, clinical workers and laboratory workers. Physicians gave more positive ratings of ‘institutional commitment to safety’ than did nurses, clinical workers and laboratory workers. ‘Teamwork climate’ was rated more positively by physicians and non-medical workers than by clinical workers.

Non-medical workers gave more positive ratings of ‘work satisfaction’ than did physicians, nurses, clinical workers and laboratory workers. ‘Working conditions’ was rated more positively by laboratory workers and non-medical workers than by physicians, nurses and clinical workers; clinical workers gave higher ratings than did physicians and nurses. Physicians and nurses rated ‘collegiality’ more positively than...
did laboratory workers. Physicians and non-medical workers gave more positive ratings of ‘relations with supervisors’ than did nurses, clinical workers and laboratory workers; nurses gave higher ratings than did clinical workers. ‘Perceptions towards the hospital’ was rated more positively by non-medical workers than by physicians, nurses, clinical workers and laboratory workers. ‘Perceptions towards the hospital’ was also rated more positively by clinical workers than by physicians and nurses, and by laboratory workers than by nurses. Physicians and non-medical workers gave more positive ratings of ‘career perspectives’ than did nurses, clinical workers and laboratory workers. Nurses and clinical workers did, however, rate ‘career perspectives’ more positively than did laboratory workers.

Significant positive correlations ranging from 0.27 (between the dimensions ‘collegiality’ and ‘working conditions’) to 0.68 (between the dimensions ‘work satisfaction’ and ‘career perspectives’) were found between all dimensions (see Table 3). Correlations between dimensions for each professional group were similar in magnitude (differing from the correlations based on the entire group by 0–0.13, except for laboratory workers for whom the differences ranged from 0 to 0.26) and significant at \( P \leq 0.001 \). Correlations above 0.59 were found between the dimensions ‘institutional commitment to safety’, ‘teamwork climate’ and ‘team performance’, suggesting common variance attributable to shared awareness of safety procedures. The ‘team performance’ dimension was highly correlated with the dimensions ‘collegiality’ and ‘work satisfaction’. The ‘work satisfaction’ dimension was also highly correlated with ‘working conditions’. Correlations above 0.59 were also found between the dimensions ‘perceptions towards the hospital’, ‘work satisfaction’ and ‘career perspectives’, suggesting that this part of the questionnaire measured underlying organizational climate.

### Discussion

A questionnaire study was conducted to determine how different professional groups perceive safety culture. In general,
ratings of organizational and safety culture were positive. However, in an institution where few had strong negative responses, we still detected small, but statistically significant, differences between professional groups. Physicians and non-medical workers tended to give more positive ratings of dimensions of organizational and safety culture than did nurses, clinical workers and laboratory workers. In particular, physicians evaluated institutional commitment to safety as well as relations with supervisors and career perspectives more positively than did most of the other professional groups, rated collegiality more positively than did laboratory workers and rated teamwork climate more positively than did clinical workers. Non-medical workers gave more positive ratings than did all or most other professional groups for work satisfaction, working conditions, relations with supervisors, perceptions toward the hospital and career perspectives, and rated teamwork climate more positively than did clinical workers. On the other hand, nurses were relatively negative regarding working conditions and perceptions toward the hospital. Clinical workers gave more negative ratings to teamwork climate than did physicians and non-medical workers and were relatively negative regarding relations with supervisors. Laboratory workers gave more negative ratings to collegiality than did physicians and nurses and gave the most negative ratings of career perspectives.

The fact that nurses and clinical workers perceived less institutional commitment to safety than did physicians may suggest that they are more likely to observe deficiencies in the organizational infrastructure related to patient safety than are physicians [14]. Nurses and clinical workers often spend more time with patients than do physicians [14, 22], and thus may receive complaints and hear opinions from the patients’ perspective which influence their own perceptions of safety procedures [14, 23]. Laboratory workers, on the other hand, may not feel directly involved in patient care practices and this may influence their ratings of institutional commitment to safety. Physicians and nurses are also likely to differ in their perceptions of the usefulness of safety rules and guidelines for patient safety and clinical practice. McDonald et al. [24] suggested that compliance with safety rules and guidelines plays a greater role in nurse clinical practice than in physician practice. Physicians tend to ignore safety rules and guidelines and use the non-routine nature of events (i.e. that each patient needs different clinical treatment) as an argument against conforming to safety rules and guidelines. It may be this greater emphasis on safety rules and guidelines that is perceived as part of nurse professionalism and safe clinical practice that makes nurses more critical than physicians of institutional practices with regard to patient safety.

The relatively negative nurse ratings of the dimensions ‘working conditions’ and ‘perceptions towards the hospital’ are unsurprising given that work dissatisfaction and high turnover are well-documented problems in the nursing profession [23, 25, 26]. Inflexible working schedules, overwhelming workloads and an unsupportive health-care environment have been shown to lead to burnout among nurses. This is especially problematic when the hospital management focuses on improving productivity [23] rather than patient safety. Improving working conditions of nurses, for example, scheduling more reasonable working hours and providing better ergonomic and psychological supports, can improve nurses’ work satisfaction [25–27] and lead to better patient safety outcomes [28].

The relatively negative perceptions of teamwork and relations with supervisors of clinical workers may be due to the fact that these workers often play a supporting role in delivering patient care and may be expected to report to physicians (e.g. to complement the process of patient diagnosis) rather than taking part in the whole course of diagnosis and treatment. The relative independence of the clinical workers in performing tasks and dependent position with respect to physicians in the whole process of patient care may influence clinical worker perceptions of teamwork.

Laboratory workers, whose primary tasks are examining and analyzing body fluids and cells [29] and who tend to work independently rather than in cooperation with coworkers [30] gave more negative ratings than did physicians and nurses for the collegiality of the atmosphere and gave the most negative ratings of career perspectives. Because laboratory workers are used to working in a more solitary working environment than are physicians and nurses, their relatively low ratings of collegiality may reflect a low involvement in collaborative activities. Laboratory workers are increasingly playing an integral role in patient care (e.g. advising physicians about what samples to take, developing clinical guidelines and validating laboratory results). Improving the collaborative aspects of laboratory work is therefore a point of concern [31]. The fact that laboratory workers were more negative than were the other professional groups about perceived opportunities for career development also suggests that future research should concentrate on this potentially vulnerable group.

The positive correlations found between the safety culture dimensions, although moderate to high, were lower than those found in a study using the SAQ [12]. One explanation for the differences is that the SAQ was developed as a diagnostic tool aimed at those who work in clinical areas (i.e. patient care areas) as the group level of interest, whereas the current study compared safety culture between all professional groups. Given differences between professional groups and departments [9, 14], the finding of less shared variance between dimensions is not surprising. Nonetheless, the correlations between dimensions do suggest that organizational efforts to improve clinical and laboratory workers’ collaborative skills can also improve their perceptions of organizational commitment to safety and teamwork. Also, organizational efforts to raise nurses’ work satisfaction may raise their appreciation of the hospital’s objectives and policies, just as organizational efforts to give laboratory workers more opportunities for career development may improve their work satisfaction.

Limitations of the current study include that use of the questionnaire has so far been restricted to the Netherlands. However, as the items in the questionnaire cover all the dimensions in the SAQ except for ‘stress recognition’, it should measure most aspects of safety culture. Moreover, although the number of participants in each group in the
study fits the profile of the target population, we cannot preclude non-response bias.

Conclusions and recommendations

Professional groups vary in how they perceive different dimensions of safety culture, and this finding suggests that group-specific interventions should be a part of any campaign to improve safety culture. The findings also suggest that some interventions should be expanded to include groups other than the group for which they were developed. For example, intervention programs such as ‘executive walk rounds’ [32], in which hospital executives make visits to patient care areas to discuss patient safety issues with frontline workers, should include not only physicians and nurses, but also clinical and laboratory workers. Involving clinical and laboratory workers in ‘collaborative rounds’ [31, 33], in which hospital workers from different disciplines conduct rounds together to discuss current and future plans of care and any patient care problems with patients, may also raise awareness about the importance of the team in patient care processes. Improving safety culture must involve those who set policy and those directly involved in patient care. Hospital leaders need to present and discuss the results of safety culture studies with all staff to raise awareness of safety culture and to break down barriers between managers, team leaders and all workers who play an integral role in patient care [9, 10, 34].

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References


