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Organizational and social-psychological conditions in healthcare and their importance for patient and staff safety. A critical incident study among doctors and nurses.

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ABSTRACT
Research on patient safety has indicated that focusing on technologies, routines, control systems, and individual caregiver attributes is not sufficient. The aim of this critical-incident interview study was to identify organizational and social-psychological conditions and processes that Swedish physicians and nurses (n=36) perceived as important for patient and/or staff safety, and participative safety behavior. Injury due to psychological overload was the most salient type of healthcare worker hazard. Patient and healthcare worker safety went hand in hand. Good patient safety was present when caregivers had good access to their psychological and social capacities. These functions were jeopardized by stress. Our results indicated that quantitative overload, excessive cognitive and emotional complexity, lack of social support and good teamwork, organizational instability, and distrust for and frustration with the way healthcare organizations were managed, caused stress related function impairment in staff, which lead to mistakes and near misses. These aspects also in themselves contributed to risks. Good safety was associated with adequate resources and routines, workplace learning, and supportive unit level managers and colleagues. Features of professional cultures related to ethical norms to offer best possible care for the patient, in spite of insufficient resources, contributed to acceptance of working conditions that could lead to stress and overload.

Keywords
Patient safety; healthcare worker; stress; demand-resource; critical incident, occupational safety.

1 INTRODUCTION

Insufficient patient safety and occupational health and safety for doctors and nurses are substantial problems, causing suffering for individuals and costs for the healthcare industry, which is economically pressed already by the large and increasing demands for health care.
Interventions to improve patient and occupational safety in health care have, to date, largely focused on improving and enforcing routines and introducing new equipment. However, in order to be successful, such interventions need to better consider social and organizational contextual factors (Ovretveit, 2009). Systems for formal responsibility enforced by authorities and pointing towards the individual is another common approach. Such systems may lead to underreporting of incidents and may thus actually make safety worse, because incidents are not used for learning and improvement (Aase, et al., 2008; Catino, 2008). Vincent (2009) stated the need in patient safety research to take social and cultural phenomena into account, and to increase the use of qualitative research methodology. Obviously, good routines and procedures are important for patient safety, but the degree of detail in such regulations must be adequate, and even here good results are dependent on social-psychological factors (Katz-Navon et al., 2005). Organizational climate theory (Schneider, 1975) attempts to explain such social-psychological factors. Safety climate is a specific domain of

organizational climate. It regards aspects of the organizational climate that are of relevance for safety, and has been defined as workgroup members shared perceptions of policy, procedures and practice in relation to safety in the organization (Neal and Griffin, 2002; Zohar, 1980). Through communication and social interaction within the group, shared meaning and order develops regarding how safety should be valued and handled. The shared climate thus contributes to the development of social norms related to safety at the workplace, influencing individual behavior (Cheyne et al., 1998). In a workgroup where the shared safety climate is high (positive) one may thus expect a higher degree of safety behavior, and a lower accident rate, than in a group where the safety climate is low (negative). There is strong empirical support for such relations regarding occupational safety from studies in a variety of occupational branches (Beus, Payne, Bergman, & Arthur, 2010; Christian, Bradley, Wallace, & Burke, 2009; Glendon, 2008; Kuenzi & Schminke, 2009; Larsson-Tholén, Pousette, & Törner, 2013) as well as in health care (Neal et al. 2006).
Less research has, to date, been performed regarding patient safety climate, but empirical studies support a positive relation between patient safety climate and patient safety (Kuenzi & Schminke, 2009; Scott, Mannion, Marshall, & Davies, 2003; Hofmann & Mark, 2006). Another climate domain that has been studied in healthcare contexts is team climate (Poulton & West, 1999; Ylipaavalniemi, et al. , 2005), defined in terms of team member active participation, team openness to diversity, interaction frequency, and dedication towards shared goals and high performance standards. So, if safety is among team goals, a strong team climate should be expected to predict safety.

Schneider (in Kuenzi & Schminke, 2009) emphasized the importance in future organizational climate research of elucidating the conditions that determine the quality of organizational climates that develop in an organization. Schneider stated that better understanding of the impact on climate of leader practices, reward systems and resources is important for effective improvement work. The effect of organization of care on safety and safety culture and climate deserves more research attention (Weingart & Page, 2004). Organization determines the workloads and the complexities that healthcare workers must manage, as well as the organizational resources that they dispose to do this. It is well established that high job demands in terms of quantity and complexity, and lack of resources in terms of e.g. social support (practical help, sharing of information, emotional support), a good team climate, and adequate technology are threats to workers ability to perform on a sustained high level and stay healthy (Bakker & Demerouti, 2007; Bonde, 2008; Semmer, 2007; Siegrist, 2005). Research has also identified positive links between healthcare worker safety and health, and patient safety (Yassi and Hancock, 2005).

Safety outcomes are largely dependent on safety behavior. Marchand et al. (1998) identified two different types of safety behavior, safety compliance and safety initiative. While safety compliance regards complying to safety rules and regulations at the work place, safety initiative regards taking own initiatives to improve safety, such as speaking out about hazardous conditions to managers, bringing up safety issues at staff meetings, and suggesting safety improvements. The latter type of behavior has also been called safety participation (Griffin and Neal, 2000), and safety citizenship behavior (Hofman, Morgesson and Gerras, 2003) and while safety compliance may be considered important to uphold a certain level of safety at the workplace, by following procedures installed to mitigate risks that have already been identified, safety participation is important for identifying new hazards and stopping potentially hazardous conditions from developing into risky situations.

It thus appears as imperative to study organizational and social-psychological conditions and processes that support and hinder the development of good safety-related climates as well as participative safety behaviors in health care. Since safety climate is formed through shared interpretations of how safety should be valued and enacted, based on perceptions of events, behaviors and processes within the organization, detailed descriptions of such situations is a suitable source of information in this type of research. Likewise, participative safety behavior has been shown to be dependent on contextual factors within the organization (Hofman et al., 2003; Martínez-

Corcoles et al., 2012), and different aspects of leadership have been found to motivate compliant and participative safety behavior (Griffin and Hu, 2013). More in-depth knowledge on the type of conditions supporting participative behavior is therefore warranted.

Aim

The aim of this critical-incident interview study was to identify organizational and social-psychological conditions and processes that Swedish physicians and nurses perceived as important for patient and/or staff safety, and participative safety behavior, in hospital care and homes for the elderly.

2 METHOD

The study was a qualitative interview study among a strategically selected group of Swedish physicians and nurses (n=36). This study was complemented by four focus group interviews. In both types of interview a critical-incident technique was used.

2.1 Strategic selection of participants in individual interviews

The participants in the individual interviews were strategically selected based on results from a questionnaire study among physicians, nurses and auxiliary nurses working in the Western Götaland Region of Sweden (Pousette, et al., 2014). A convenience sample of 150 units from two hospital organizations and three municipal homes for the elderly provided questionnaire data on safety climate and participatory safety behavior. The hospital organizations were one university hospital organization comprising 3 hospitals, and one regional hospital organization comprising 2 hospitals. 124 of the units were care units comprising nurses and auxiliary nurses in hospital care and elderly care, while 26 units were clinics in hospital care, i.e., organizational subunits where physicians had their organizational base, containing care units with similar types of care. The clinics that participated were within the following specialities: emergency room; orthopedics; infectious diseases; general medicine; geriatrics; dermatology; anesthetics; ophthalmology; gynecology; pediatric medicine; pediatric surgery; and thorax. Below, the term unit will be used to denote both nurses' and auxiliary nurses' care units, and physicians' clinics.

In the individual interview study we aimed at getting participation from health care units that had rated the safety climate as high (positive), as well as from units with low ratings of safety climate. We also wanted participation from units where participative safety behavior was generally rated as high, as well as from units with low such ratings. All participating caregiver organizations should also be represented, and we wanted a mixture of physicians, nurses, and auxiliary nurses.

Procedure for selection of nurses: Based on the questionnaire results the units belonging to the upper and the lower tertiles for safety climate were identified. Within each such tertile the 6 units with the highest and the 6 units with the lowest mean values for participatory safety behavior, respectively, were identified. This resulted in 4 categories of units regarding safety climate-safety participation scores: high-high; high-low; low-high; and low-low, in all 24 units. From each unit a nurse or an auxiliary nurse was invited to be interviewed, in all 12 from each professional category. The final selection of individual participants from the selected units was made according to criteria and a convenience principle. Criteria were: having worked at the unit a minimum of 75% of full-time during at least 1 year directly prior to the interview and not in a managerial or supervisory position. If more than one nurse or auxiliary nurse fulfilled these criteria, volunteered to participate, and was available taking work schedules into account, selection among these was random. Practical problems made one auxiliary nurse interview impossible to perform. Interviews were thus performed with 12 nurses and 11 auxiliary nurses.

The procedure for selection of physicians was similar but with clinics as the basis for recruitment, and 14 units were selected. The classification of the units according to safety climate was based on median split, followed by selection of units with high and low participative safety behavior, respectively. From each of the 14 units, physicians were selected according to the same criteria and procedures as nurses. One interview could not be performed due to practical reasons, resulting in 13 physicians participating in the individual interviews.

Procedure for selection of physicians and nurses for participation in the focus group interviews
To further validate results of the individual interviews, we performed four focus group interviews (Kitzinger, 1995). Each focus group was intended to comprise three participants from different units. In one case a physician was unable to participate, due to urgently being needed in health care work. The focus group participants were selected from the 150 participating units. The first step of the selection was strategic. Group 1 comprised two auxiliary nurses and one nurse from elderly care; group 2 comprised two nurses and one auxiliary nurse from the university hospital organization; group 3 two physicians (three were intended) from the university hospital; and group 4 three physicians from the regional hospital organization. The second step of selection was from convenience, according to availability, but excluding participants in the individual interviews.

2.2 Data collection

Individual interviews. Data in the individual interviews were collected April-September 2011. Each individual interview lasted approximately one hour, was recorded, and transcribed. The second author interviewed most of the nurses and the first author interviewed most of the physicians. Interviewers had no information about which safety climate/safety behavior category participants belonged to. The interviews were based on critical incident technique (Flanagan, 1954). First, the participants were shown a list of types of patient- and staff injuries that, according to official statistics, were most common in Swedish healthcare. This was intended to establish a definition of "injury". Note that mental overload or stress were not featured on this list, just "sudden overload" without reference to what kind of overload. Then participants were asked to recall and describe situations they were well informed about, and where a) patients were or may have been injured; b) patient safety was managed in a particularly good manner; c) staff were or may have been injured; d) staff safety was managed in a particularly good manner; e) the participant or a colleague had taken an initiative to improve patient or staff safety, f) the participant or a colleague had not taken such initiative, although such initiative would have been desirable. Follow-up questions were posed to get rich descriptions, according to phenomenographic prinicples (Marton, 1986; Bowden, 2000). This means that no content whatsoever was suggested by the interviewer, only questions such as "how", "could you tell me more about that", etc. were posed. It is noteworthy that we did *not* ask respondents about organizational and social-psychological conditions and processes. They were free to talk about anything as long as it had to do with the kinds of critical incidents they had chosen.

Focus group interviews. Focus group interviews were performed in November 2012, after data from the individual interviews had been analyzed. Similarly to the individual interviews a critical incident method was used. The focus group participants were initially asked to individually, for five minutes, think about a situation where safety had been handled in a very good manner, to reflect on the characteristics of this situation and identify 3-5 key conditions or phenomena that had contributed to the high level of safety. Each participant noted each such condition on sticky post-it slips. Subsequently the same procedure was repeated regarding a situation where safety had not been satisfactory. As the next step, the participants posted their post-it slips and the group jointly discussed and sorted their positive and negative descriptions into thematic categories. New post-it slips could be added, if the members of the group identified additional key phenomena.

2.3 Data analysis of individual interviews

Inductive thematic analysis (Braun and Clarke, 2006) was performed. All interview data were scrutinized by both interviewers in order to identify eventual leading questions where content was suggested by the interviewer (Bowden, 2000). No such instance was identified. We did not categorize the kinds of critical incidents that were described, but some examples will be presented in Results. Neither did we categorize the kinds of injury implied in the critical incidents, but will exemplify in Results. Our focus in coding was to identify conditions and processes that the participants identified as important for patient and/or staff safety, and participative safety behavior. The first author coded all physician interviews and the second author coded all nurse interviews. They also made separate preliminary thematizations. This allowed for themes unique in the respective staff categories to emerge. Both researchers read all interviews and discussed the two thematic structures. A common thematic structure was not sought, but reliability of the thematization was considered satisfactory if the researchers could understand and accept each other´s theme structures (Bowden, 2000).

The analysis so far comprised four main categories with more than 70 sub-themes. The following main categories were identified: 1) individual attributes of workers, managers and attributes of groups; 2) organization, coordination and resources; 3) physical environment, facilities and ICT-systems; and 4) perspectives (mainly ethics) on care, own role, and patients. . For this article, the themes that concerned organizational and social-psychological conditions and processes, within main categories 1, 2, and to some degree 3; and most of which were common for physicians and nurses, were selected and condensed into the structure presented in Results.

The results of the focus group interviews were similar to our thematic structures from the individual interviews, and no new themes emerged. Subsequent to the thematization work in the focus groups, the results of the individual interviews were presented to and discussed in the groups. The members of all focus groups expressed that they understood and accepted our results as valid.

2.4 Ethics

All participants gave informed consent for their participation. The study was approved by the regional research ethics committee in Gothenburg (2010-08-05, No. 276-10).

3 RESULTS

3.1 Examples of critical incidents

More than 200 critical incidents were described in the individual interviews. Most of these featured organizational and social-psychological conditions and processes. This study did not aim at systematically describing the critical incidents. The following examples are listed to give an idea of situations that were mentioned in interviews.

Bad: Far too high medicine doses were administered; information about patient medication in a disorderly state; misunderstandings when patient information was communicated between units; junior surgeons performed surgery that was beyond their level of competence; patients referred back and forth between elderly care and hospitals or between hospitals; doctor forgot to check medical test results; doctor could not find test results; violent patients; hospital managers forced a unit caring for very infection-vulnerable children to accept a patient with multi-resistant bacterial infection; hospital bureaucracy caused delays in buying low-cost equipment that was critically important in infection prevention.

Good: Faulty diagnosis based on prejudice about patient with social stigma was avoided by physician who, in spite of serious time pressure, and supported by senior colleague, carefully adhered to examination routines; good care in life-threatening situation during childbirth made possible by unusually good staffing that was due to lucky circumstances; experienced nurse helps doctor prescribe correct medicine dose; unit nurses collaborate to improve evidence-base of caring routines; the full care team could make time to briefly meet up at the intensive care unit (ICU) before admitting the patient to a following care unit. The team could thus meet both the patient and the ICU team, and jointly plan the subsequent care, saving much time and securing quality of care.

The following incident is illustrative because in one short story, it features many of the themes in our results.

"It was a stressful situation where a patient was really ill and I tried to transfer the patient to a ward where there were more competent nurses and thus had to call around repeatedly to three or four wards, because no one answered. Those wards had no room for the patient and so I had to prescribe this medication. Then a nurse asked me "shall it really be that much?" And then I said yes, yes, because I had calculated the dose two or three times but made a mistake when reading [the dosage routine]*. And then she asked me once again and then I looked in the routine again and realized my mistake. But then, the infusion of the medicine had already started...Luckily, it was a slow infusion* [and we could stop it in time]*."* Physician

3.2 Injuries, strains, and positive effects

Patient risks mentioned in interviews included injury due to falls, infections, inadequate examination, diagnosis, and treatment. Staff risks included infections, cuts, physical overload, and abuse and violence from patients or their kin. However, the kinds of staff injury that pervaded our data concerned psychological impacts such as stress, impairment of cognitive and social functions, anxiety, fatigue, disillusionment, feelings of being exploited, eroded work motivation, difficulties to sleep and recover, and depression. That is, mostly injury that builds up during a period of time rather than occurring at a specific point in time. Acute psychological trauma could also be a feature of incidents involving very serious mistakes or exposure to violence. The positive incidents were associated with professional pride, and feelings of achievement, control, and meaningfulness.

3.3 Imbalance between demands and resources created risks for patients and staff

High quantitative and qualitative demands created stress and made mistakes more likely
Safe behavior by doctors and nurses was dependent on the degree to which they had access to their psychological capacity in terms of memory, patience, vigilance, carefulness, conscientiousness, concentration, flexibility of thought, and ability to communicate effectively with colleagues and patients. In situations of high stress caused by quantitative overload and time pressure (which could be the normal state at some units), emotional pressure from patients, the complexity of the health problems as well as the organizational conditions, and the volume and complexity of the information that had to be managed, these capacities were eroded. This made mistakes and risky shortcuts more likely. Mistakes, in turn, caused still more stress in doctors and nurses.

"That you realize that it´s me, I have to do something about it, then you can always forget it or that you...the speed is to high..." Physician

"It must go quickly, quickly, quickly, all are so bloody stressed..." Nurse

Inadequate resources contributed to patient risks regardless of staff stress

Lack of staffing resources or patient beds meant that patients could be rejected, sent home prematurely or had to wait in order to be examined or treated. Time pressure created by resource deficits could also mean that examinations and treatments were performed less carefully, in order to produce. Also, due to lack of resources at one ward, patients could be transferred to other wards where adequate resources to manage them may not be available.

"If all beds in the ward are occupied, you can´t say that patient safety is high." Nurse

"Lack of time is a very decisive factor for much of that we have been talking about [in the interview]*, this about going through prescriptions and medication lists and test results, and communication of information also, actually. It is extremely central, the lack of time."* Physician

Sufficient resources in terms of time, knowledge- and social support, and buffer capacity (staff, beds) were mentioned during stories about positive critical incidents.

3.4 Acceptance of staff risks is a feature of the professional norm systems

Healthcare workers had perceived norms to the effect that they should accept working on a high stress level without complaining. This contributed to risks for patient injury when caregivers were negatively influenced by stress. These norms were associated with a tendency to take risky working conditions for granted, such as long work-shifts, high workload, and large responsibility for patients in relation to experience and competence level. The norms were communicated during education and training, and were reinforced and became routine during work in the healthcare system.

"And when you talk about it, it´s like "Stop being a chicken, you are a doctor, damn it." Physician

Readiness to work hard and uphold professional standards as well as motivation and courage to voice safety problems were bulwarks for safety in situations of high stress.

"I think that safety is still high and that is much because we are personally engaged nurses here, so far, and we are good at working harder and harder...so far, we struggle like a Swedish workhorse, work harder and harder to uphold patient safety and it is still rather good." Nurse

But these were eroded by stress. Instead, hopelessness and a lack of control could lead to a disillusioned "I don't care because it´s no use"- attitude, an " it´s not my formal responsibility"-attitude, intentions to leave, and ultimately, health consequences for the caregivers themselves such as fatigue and depression, or injury due to risk-acceptance.

"Virtually every day I see medicines that are not properly prescribed and which I may not call attention to. Because when I´ve done it so many times, I may not care to do it again." Nurse

3.5 The functionally specialized system

The importance of effective communication and coordination

The care system was divided into functionally specialized organizations and units. Functional specialization was seen as necessary due to the complexity of health problems and medical knowledge. Also, examinations and treatments could require special equipment and other facilities. Patients must cross borders between and within caregiver organizations in order to get adequate treatment. This made communication and coordination between the functional units critical.
The system also involved several professions with complimentary and specialized roles; doctors, nurses, and others.

"Because patients are moved around and there are different doctors /.../And then one doctor has referred a patient to X-ray exams. And then...the patient is moved and then this [other] *doctor writes a new referral to X-ray. And they have not* [coordinated this]*. Because /.../ they have called* [from X-ray dept]*, and asked for patients and then they have already been down to the X-ray department."* Nurse

Functional specialization occurred within professions also. Communication and cooperation between professions and between individuals was critically important for patient safety. Stress made communication mistakes more likely, and the risk of mistakes created more staff stress.
Staff also moved over organizational borders. Doctors frequently worked at different units with different routines and practices. Temporary staff, doctors as well as nurses, moved across unit borders. All this could lead to uncertainty and mistakes about routines and practice. This contributed to cognitive and social complexity, and to stress load. Mistakes got more likely. The specialization and fragmentation contributed to uncertainty regarding who was responsible for a certain patient. This could lead to mistakes when it came to following up test results.

"...and then the nurse misunderstands and writes something wrong. I experience the situation, and then the nurse shall document it. And then there may be misunderstandings..." Nurse (auxiliary)

Getting rid of the patient rather than curing the patient
Because budgets were functionally divided, and "budget first" was perceived as the essence of signals from higher management, negotiations about which caregiver system, i.e. hospital, primary care, or municipal elderly care, or which hospital subunit, should cover which patient costs could lead to inadequate patient treatment. In a sense, getting rid of the patient could become the aim, not curing him. This could cause staff stress due to doubts about whether this was medically rational and in line with professional ethics.

"If the patient needs to be monitored every hour, than he should not be in our ward. They [intensive care unit] *did not think they had room for him."* Nurse

Fragmentation and discontinuous patient-doctor relations
Fragmentation and discontinuous patient-doctor relations (split between several doctors) make information and communication critical. The multi-doctor situations were vulnerable in this regard because no one had a full picture of the patient´s status and because important signs and other information may be overlooked. Mistakes may happen, causing patient injury. This uncertainty and its accompanying risk for serious mistakes was also a source of stress for staff.

"It often happens that a patient comes to the unit and meets a doctor. The pair decides about operation. Then when the patient comes to be operated, another doctor draws an arrow [on the patient] *to indicate where surgery should be performed. Then a third doctor does the actual surgery. A fourth doctor sees the patient and discharges him from the hospital, and in the worst case a fifth doctor follows up the patient."* Physician

3.6 Organizational instability due to reorganizations, temporary staff, and turnover may destroy cooperation

Organizational instability due to temporary staff, turnover and reorganizations was associated with injury risks and stress. And staff stress and frustration with the imbalance between the demands of work and the resources available was noted as a cause for turnover.

"I think things are not moving in the right direction. It is getting worse and that means that the workers who are most competent and has the longest experience, they quit because they can´t bear it and that means that you lose competence in all wards...so that is also a risk." Nurse

The important cooperation between organizational units, professions, and individuals could not be satisfactorily managed with routines, technology, and formal relations. Safety depended on interpersonal communication, trust, knowledge about local practice and routines, staff readiness to take responsibility beyond formal role definitions, and problem-solving networks on the unit level. All this was threatened by organizational instability, causing uncertainty, mistakes, and stress.

"Part of it, I think, is that it is different doctors here all the time, never the same doctors. Temporary doctors also. And then, there is no...It is always easier when you work with the same persons and know how they function and so on." Nurse.

3.7 Systems and routines could not eliminate all risk

Routines and standards could promote safety but were vulnerable to resource deficits
Standards and routines were seen as good for patient safety in cases where they were adequate, such as when treating physical trauma or commonly performed types of surgery. Routines for examinations and diagnosis were abundant and were seen as necessary and good. Routines to avoid physical overload on staff could also be protective. But all situations could not be covered by routines, and time pressure could mean that risky shortcuts, that worked most of the time, could be taken.

"What´s good for us...and actually has to do with safety...is that we work in a similar way...that we have a way of working that does not differ from one individual to another." Physician

Routines could be created and/or adjusted locally. This included e.g. routines for information, hygiene, management of acute stress and aggressive patients. Cooperation and communication were important for achieving this. A problem with such local routines was that they might not be known by temporary, ambulatory or new staff. This could lead to risks. Safety regulations could also be perceived as too detailed. Many routines and their high level of detail contributed to cognitive load and uncertainty.

Information systems intended to facilitate documentation and information retrieval created risks
Digitally based patient information systems, e.g. journals, could not cover all information needs, between caregiver organizations; between hospitals; between units; between individuals. This could be due to deficiencies in the systems themselves or incompatibility between systems. These problems made other information media necessary, such as talking and writing on paper. This medial complexity could lead to missed information or misunderstandings. This was more likely to occur when staff was stressed and when contact between caregivers and patient was discontinuous. Good communication and information management required time, psychological capacity to concentrate on complex information, and was facilitated if the parties had an established cooperative relationship. Stress, staff discontinuity, and reorganizations could destroy this.

"There are very many safety systems, journal keeping, lab-results, notes, signing, very many things around [patient care]*that take time, that you are supposed to have time to do. And it takes time if you are to be careful, not careless /.../ It means checklists, tests, it means very much more."* Physician

Administrative systems could be filled with invalid information and contributed to overload
A number of administrative systems intended to improve safety and quality through statistical safety- and quality control, imposed by higher management and authorities, contributed to quantitative and

qualitative job demands and caregiver anxiety. The latter was because doctors and nurses were made legally responsible for patient injuries. On the other hand, when incident reports were taken care of more locally and with a learning rather than a blaming intention, follow-up of incidents were perceived as positive for safety, since they could give opportunities for reflection and improvement of practice.

Reporting systems also ran the risk of being filled with invalid or incomplete information when staff members prioritized patient care in times of time pressure, which could be more or less constant.

"We rarely have time to write [injury and incident reports]*/.../ We ought to do it much more."* Nurse

They could also contribute to feelings of meaninglessness in case no feedback was given on reporting; when reports just vanished into a "black hole".

The ICT-based systems for patient journals and other documentation featured several problems. They could contain invalid information, e.g. about medication. Different systems could be incompatible, making double documentation necessary which contributed to work overload and motivated sloppy documentation. Since information quality and -flows were critical for safety, these systems featured risks for patients and for staff stress. Adherence to documentation routines also implied extra work, for which no extra resources were allocated.

"There is no time for administration in our work schedules so you have to do it during non-existent time. Test results and that kind of thing you must do...There is no scheduled time for it." Physician

This could lead to the effect that formalities became more important than patients, because the former was that which the organization and authorities reinforced.

" [The hospital management and healthcare authorities] *are not particularly interested in asking how they* [the patients] *feel and think, but it is this productivity that is important...that* [formal documentation systems] *are completed properly, and to manage formal contacts with* [other caregiver systems involved] *properly...so that which is visible and can be measured in some way...And then it is caring for your* [nurse] *license that comes first.*" Nurse

Physicians questioned whether routines could solve safety problems related to stress and lack of competence.

"No, the human factor...I mean, you are simply tired, you make mistakes, sometimes you make mistakes. Or you make mistakes due to ignorance, you don´t understand what you are doing." Physician

3.8 Unit level cooperation, support, and improvement work to manage stress and create safe organizing

Developing and maintaining teamwork and workplace learning

Hospital care as well as elderly care was dependent on cooperation within and between categories of staff. Individuals functionally impaired and emotionally upset by stress needed social support. Thus, cooperation and support among nurses and doctors was important for patient safety as well as staff safety. Within and between professions, ideas, and information could be provided. Mistakes, e.g. concerning medicine doses, could be corrected. Emotional support and practical help could be given. Good cooperation and support was dependent on the group´s maturity in terms of role clarity. This concerned i.a. who was formally and/or operationally responsible for different tasks. Cooperation

also concerned openness and trust. Building, maintaining, and utilizing good cooperation became more difficult when time pressure was high and when individuals were stressed, so lack of time and space for reflective interaction was associated with less safety. Stress also made staff forget good ideas. Organizational instability could destroy cooperative structures and processes.

"Still, we have good cohesion in the group and you dare to bring up everything. It is not like if someone brings something up, they get shit for that. So it is still a very good group to discuss with and I think also that it is good that the managers take part in discussions." Nurse.

Unit- level collaborative work to improve care and prevent stress and injury was described as the way to manage the complexity and the demand-resource imbalance. It was also the arena at which new ideas and knowledge could be introduced at the units.

"We have a living discussion. Problem cases are discussed in groups. /.../it is very open and humane here. /.../ I think it is because there are a number of colleagues here who have worked in that spirit for many years." Physician

This function was also dependent on inter- and intra-professional teamwork. Senior and otherwise high-status colleagues were important as leaders and role models in this regard. Clinging to prestige and hierarchies, on the other hand, counteracted teamwork and support.

"It is a small unit, not so big. One tries to avoid exaggerated hierarchy. All shall be able to socialize as a group, together, have a coffee break together. You get a sense of working together. And then you may get a sense of shared responsibility." Physician

Organizing in too small nursing units made intra-professional support more difficult, since you might not have direct contact with colleagues.

"You have to listen to the experienced and learn from them, and we ask each other all the time, even the experienced ask each other all the time. We have each other as back-ups and discuss all the time how do we do this, what do you think here, can you have a look at this for me, we all have different backgrounds and are good at different things, and we do this much and it is because it shall be safe, one does not want to make mistakes, so that´s good." Nurse

A sufficient degree of mandate to decide on organizing and routines, as well as readiness by the organization to accept costs associated with local improvements, were important in order to make engagement in improvement work appear as meaningful. Having mandatory meetings where nothing substantial could be decided was negative for morale.

Temporary staff, which could be abundant, did not and could not, contribute optimally to teamwork or engage in local development work. Turnover and frequent reorganization caused the same problem. Both were thus associated with worse safety for patients and staff.

Inter-unit collaboration was made necessary because of the functional specialization of care organization. The same conditions mentioned above as relevant for unit-level cooperation applied here also.

Active and supportive unit level managers were important for safety and working environment
The unit-level management could play an important role in initiating and supporting teamwork and local improvement processes. Active unit level managers could prevent long work-shifts and accumulation of overtime for doctors, as well as actively define and take responsibility for goals in terms of quantity and quality.

"Then the question is, when do you not organize your work well enough and when is the workload so high that no one had managed to organize it better?/.../ Then the manager must go in and look at it: what was the task, and was it actually done well enough." Physician

Also, because conflicts happened that could threaten teamwork, unit level management and seniors were important as conflict preventers and -managers. Passive managers or managers that were perceived as insensitive to staff needs contributed negatively in this regard, and thus to patient and staff safety. High turnover among unit level managers contributed to problems with manager support and effective leadership. Such discontinuity also jeopardized local development work, since implementation and testing of new ideas required continuous learning processes.

"*We felt that our new manager was more or less ordered to take the position. She did not apply for it. We felt unsafe. Our manager was not present. She was more like a manager that went away on meetings and things, so it was a tough situation. Things like that have made many of us feel bad. When we had a manager who was not helpful."* Nurse

The supportive role of local managers was jeopardized by decisions made by higher levels in the care organizations. These decisions concerned resource cut-downs as well as increasing administrative burdens to satisfy central administrative control.

3.9 Higher levels of management can jeopardize safety

Cost-cuts, downsizing, and reorganizations that ruin teamwork jeopardize safety
Budget control was described as centralized. Decisions about downsizing and reorganizations were taken by higher management. Healthcare workers expressed perceptions of not being listened to and taken seriously by higher management. Since resources and organizational stability was important for safety, as described above, higher management decisions were seen as highly relevant for patient and worker safety.

"We were subjected to budget cuts in spite of many consequence analyses that we made. [Hospital management] *refused to read them because they were not written according to the formal standards of the hospital /.../ We feel that we have expressed our worry in a very, very clear way, that patient safety suffers with the staffing we have, but we have never been listened to."* Physician

"[Safety]*, we do not feel that they are interested in that. It is the budget and the money and they compare figures all the time. Then what the patients think, what workers think, we do not perceive that they are particularly interested in that."* Nurse.

Insufficient investment in continuous staff training and competence maintenance may cause patient and staff risks.
New knowledge and methods for diagnosis and treatment are a continuous flow. Due to quantitative overload, doctors and nurses may not have time to keep up competence-wise, unless care organizations are ready to invest resources to make learning possible. This was a condition that caused frustration and uncertainty among staff, contributing to stress.

"When I look at how much of my working time is occupied by learning, discussion about the central medical issues, the essence of it all, that is, how do we manage these medical problems /.../ learning more about things, this part has been extremely marginalized." Physician

"I know very much about [specialty]*...and then* [after reorganization] *it became like, now I don´t know anything again...I felt worthless. We did not even have time to get to know each other or how we should work... We moved here on Tuesday and on Wednesday it was full activity."* Nurse

Quantitative models for defining resources could be risk-creating oversimplifications
When the models for defining staff resources did not take experience, competence and level of psychological functioning into account, units with the same staff resources in terms of number of caregivers might differed substantially in their capacity to perform. Injury risk may be caused by such conditions.

"We have said that if we shall have 30 patients, fine, but then you must have regular staff, because it does not work to staff a ward with 30% or so staff from the outside." Nurse

" I think that if you have worked a long time you may have forgotten that young insecurity and think that a head is a head and then you can place it haphazardly." Physician

Another aspect of this theme was that all patients were not equally demanding. Some required more, others required less attention and effort from staff. Thus, basing resource allocation on patient count and measuring productivity in strictly quantitative terms was seen as a risk-creating oversimplification.

"...it is not always more work with more patients, you may have five empty beds and still have a large workload. It depends on what is wrong with the patients actually. So you can have three over-admitted patients also without that meaning that much more work. It is not that simple." Nurse

Filtering of safety information
There was a perception that risk information and signals from "whistle blowers" was filtered on the way up the organizational hierarchy, causing higher management levels to make decisions based on incomplete information that was biased towards economical data. There was also a perception that higher management in fact accepted risk-taking in order to save money. The information filtering was perceived as demoralizing, making engaged staff members and middle managers disillusioned and cynical. This was seen as a mechanism that promoted silence about risks and yea-saying towards cut-downs, reorganizations and administrative systems, to satisfy central control needs in the managerial line organization.

"...she [ward manager] *cannot manage, she has not time to manage all incident reports, and then, I think, it stops there."* Nurse

"...then it is like if it does not suit the employer, then the employer stops that [risk information]*, and it does not go further up. So if it´s uncomfortable for the employer, then* [the risk information] *stays there."* Nurse

"But there is a feeling of giving up, I think, because when things are to be decided, there are many steps upwards, and it ends up among politicians and the like, and administrators who have very much power within healthcare." Physician

3.10 The mirror image

In critical incidents and accounts of causes and consequences for these, the safety-wise positive incidents commonly had features that could be said to be mirror images of the features of negative incidents. For example, good staff resources, effective communication and cooperation, adequate

routines and information flows featured in positive incidents, and inadequate staff resources, dysfunctional routines and information flows, and poor teamwork featured in bad.

3.11 Patient and worker safety go hand in hand

Another kind of mirroring concerned patient injury incidents and staff injury incidents. The situations that featured patient injury risk also featured injury risk for staff. When patients were or may have been injured, psychological stress, or staff physical injury such as cuts and infections, were also present as effects. Also, when staff was stressed or otherwise functionally impaired, patient-injuring mistakes were more likely to happen.

"And then stress generally...we did not have a break during the whole summer and particularly not during evenings and nights, maybe one time per day we had time to sit down, we ate while walking, all the time. The pulse was 200, I suppose, and it took a while after you got home before it had gone down. So, it was catastrophic...and that is patient safety also, to the highest degree." Nurse

4 DISCUSSION

Our results indicated that organizational and social-psychological conditions and processes closely related to psychosocial working environment influenced safety in healthcare. They also indicated that professionalism, cooperation and support on the "shop-floor" level were critically important for good safety. These kinds of conditions and processes are well known to be important also for staff health, motivation, learning and innovation (Karsek & Theorell, 1990; Siegrist, 2005; Kivimäki, et al., 2010).

The centrality of the psychosocial working environment

Results from the present study indicated that conditions of importance for patient safety were also important for worker safety. Doctors and nurses conceived of occupational safety not only in terms of harm that occurs rapidly due to discrete events of exposure to agents or stimuli. It was associated with exposure to stressful stimuli and prolonged high workload. Such conditions for staff were associated with events that could cause patient injury. This indicated that the psychosocial working environment for care professionals is critical also for patient safety. This idea is supported in other research (Yassi and Hancock , 2005). Our results that conditions of importance for patient safety were also important for worker safety are in concordance with Hofmann and Mark (2006) who found, in an empirical study, that a good safety climate operationalized as management safety priority and safety commitment, open communication at the workplace, openness regarding mistakes, and just treatment in analysis of mistakes, were important in regards both to patient safety and staff safety, particularly in the care of patients with complex conditions. Likewise, Pousette et al. (2014) in a questionnaire study found a strong and positive relation between occupational safety climate and patient safety climate in health care and elderly care.

The meaning of "overload"

An interesting observation from our study was that, throughout (3.2-3.7), our participants identified "overload" as psychological overload, indicating that although physical overload belongs to the most common types of statistically reported worker injury, psychological overload was a more salient problem among our participants. This, again, points to the importance of organizational and social-psychological factors in healthcare safety.

Routines and administrative systems

Routines and administrative systems could be both bad and good for safety (3.5; 3.7; 3.9), depending on whether they were adequately designed and did not create increased job demands, but helped make the job easier. One could also expect that administrative systems and routines perceived as

non-helpful, even meaningless, would contribute to the stress burden not only in terms of workload per se, but through their illegitimacy (Semmer, et al., 2007) , being appraised as offenses to the caregivers as persons professionally devoted to patient care rather that administrative control. Administrative systems could also be considered as illegitimate if they are perceived as the results of decision processes characterized by procedural injustice (Elovainio, et al., 2004; Kivimäki, et al., 2003). Perceived lack of influence on routines and systems among end-users will also make implementation of such systems ineffective (Nielsen & Randall, 2013), and the investments made in them may be wasted. This supports the well established idea that administrative systems should be designed in processes where the end-users have substantial influence. This may require substantial effort and investment, and management, workers, and stakeholders on the societal level to collaborate effectively (Nielsen, Randall, et al., 2010; Nytrö, Saksvik, et al., 2000). This is equally applicable for organizational change of any kind. Safety cannot be created through centralized control, especially when this control causes stress at the unit level.

Complexity

Healthcare systems are by their very nature complex (3.5-3.9). No single individual or professional group can handle all problems, so complexity is likely to prevail, even increase. Complexity created patient risks and staff stress. Again, good cooperative networks, time to maintain these, and time to manage the complex interactions stood out as safety resources. The routines and information systems in use in the healthcare systems we studied were not sufficient.

Culture

Safety problems related to staff fatigue were partially explained with reference to values and norms within the caregiver professions themselves (3.4).Professional culture and norm systems may be seen as the result of adaptation to organizational reality. Our results indicate that specifically physicians experience an expectancy to be highly autonomous, and master all situations. This may add to felt stress, and may also impair teamwork and learning (Carroll & Quijada, 2009). It may also impair seeking support from colleagues in order to cope with own failures and negative patient outcomes (Iedema, Jorm & Lum, 2009). Our results indicate that norm systems in favor of risk acceptance are negative for safety and health, and one may ask if a "survival of the fittest"-culture is what best serves the interests of patients, caregivers, and society. Results also have implications for how healthcare professionals are trained and socialized, since culture is transferred gradually and over time. If culture represents an adaptation to "reality", then changing the reality may be a better way to improve safety than interventions into culture.

Human Resource management

Staff work capacity and their workload determined patient and staff safety, and was not just a matter of number of staff and number of patients (3.3; 3.9). Injury occurs on the individual level, not on the level of statistical averages. So resource allocation based on statistical modeling may cause hazardous demand-resource imbalance on one side of the average, and, perhaps, wasteful surplus on the other.Organizational conditions that were detrimental to the maintenance of individual and collective work capacity destroyed essential resources built during years of education and training, involving large investments into talented people. The economical rationality of such organizational conditions could be questioned. A serious problem of organizational rationality is implied if our participants' view of the healthcare management system as one characterized by yea-saying and information filtering was valid.

The importance of teamwork

In both occupational and patient safety climate research the importance of management safety priority and commitment is widely acknowledged. Perceptions of management behavior provide important safety climate cues. However, it should be kept in mind that climate is a group phenomenon, giving rise to social norms that regulate behavior. In a study of occupational safety

climate dimensions predicting different types of safety behavior, Fugas et al. (2012) found both management espoused priorities and work group enacted norms to be important. The importance of good teamwork (N.B. in a social-psychological sense, which is something much more than having care structured around nominal teams (Anderson and West, 1998)) for quality of care and effectiveness, has been indicated in other studies (Proudfoot, et al., 2007; Poulton and West, 1999; Hann, et al., 2007; Scott et al., 2003; West, et al., 2006). Our results highlight the importance of good teamwork (including team leadership functions) also for patient and staff *safety*. Good teamwork was important for workplace learning, stress management and as a moderator between demand/resource imbalance and safety outcomes. It may be seen as a resource for the healthcare worker, helping her to manage demands. So, when demands are high (and they probably always will be), building and maintaining teamwork appears as a strategically critical aspect of safety management. The erosion of teamwork by stress and organizational instability should be seriously considered when designing systems to improve teamwork. Teamwork development and maintenance should be integrated into everyday practice and seen as strategically important, not something care workers can do if they have some spare time. This means that permanent resources must be allocated for teamwork maintenance. And the costs caused by the destruction of good teamwork by organizational instability should be considered when estimating the possible benefits of reorganization of healthcare.

Our results concerning cooperation, participation, learning, effective feedback from incident reports, organizational stability, and staff density are in line with results from quantitative research on patient mortality. West et al. (2006), based on their own and other´s research, reported statistically negative associations between staff density and experience as independent variables, and patient mortality. West et al. (2006) also reported associations between "high-performance human resource managements systems" (a composite of staff employment security, degree of investments in staff learning, the degree of performance feedback given to staff, lower degree of centralized budget and staffing control, and staff participation in decision processes) and lower mortality rates.
Our findings indicate that imbalance between the demands on healthcare workers, and the resources allocated to them, may be a basic causal factor behind health risks for patients and staff. This suggests that interventions for better patient and staff safety should consider adequate resource allocation as a way to improve safety. Exclusive focus on social conditions and processes such as teamwork and leadership may not be enough to alter demand/resource imbalance. Technology, routines, systems may be fine, but do not suffice. The safety issues were embedded in stories about how healthcare workers performed their tasks and the organizational and social conditions under which they had to perform them. Safety was not seen as a task area in itself and possible to manage satisfactory through safety routines and programmatic (Beer et al., 1990) intervention systems. Working conditions, task performance, and patient safety went hand in hand.

Methodological issues

It could be suspected that our results expressed a form of self-serving bias, or a general discourse among healthcare professionals, to the effect that "we are good and the system is bad". The idea of a general, and self-serving discourse may be plausible, but it should be noted that other research has indicated the importance of good teamwork for care efficiency and quality (Proudfoot, et al., 2007; Poulton and West, 1999; Hann, et al., 2007; Scott et al., 2003; West, et al., 2006), as well as mental health among hospital staff (Kivimäki, et al., 2010). Research has also demonstrated that active leadership, in terms of initiating structure, building good relations, and promoting innovation and learning, is important for teamwork in healthcare (Kunzle, 2010). Research also shows that high demands, in terms of quantity and complexity, may cause anxiety and depression (Bonde, 2008; Netterström, 2008), i.a. among healthcare workers (Kivimäki, et al. 2010), and it is well established that stress and fatigue can cause impairment in cognitive functions. A further argument against self-serving biases can be based on the fact that safety problems related to staff fatigue was partially explained with reference to values and norms within the caregiver professions themselves.

Selection bias to the effect that more system-negative healthcare workers were interviewed could not be ruled out, but it should be noted that our results feature many positive features of work organization.
With respect to the organizational and social-psychological conditions focussed in this study, we think that our themes were reasonably saturated (Charmas, 2006). This is supported by the observed similarity between the interview- and focus group results, and by the fact that the latter did not add any qualitative variation. But we cannot rule out that participant sampling based on theoretical sampling (Charmaz, 2006) and a larger sample, could have resulted in greater depth of thematic content, e.g. concerning professional cultures and healthcare workers´perceptions of the management system.

Conclusion

- Poor safety in health is not caused by lack of routines or administrative control systems, but stress and poor psychosocial working environment.
- Individualized and supportive leadership, encouraging professional development, resolving conflicts and supporting workgroup development, as well as trustful and supportive workgroup climates, buffer stressful conditions and thus strengthen staff and patient safety.
- Sufficient resources, in terms of sufficient manning with permanent staff to be able to accommodate temporary fluctuations in care demands without interfering with good allocation and development of competence, and without creating excessive quantitative or cognitive demands, is at the heart of both patient and staff safety.

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