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Patient Safety - Cultural Perspectives

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“People will forget what you said, people will forget what you did but people will never forget how you made them feel.”
— Maya Angelou

CONTENTS

ABSTRACT	1
SVENSK SAMMANFATTNING	5
LIST OF PAPERS	7
ACKNOWLEDGEMENTS	9
1. INTRODUCTION	11
2. THEORETICAL FRAMEWORK.....	13
2.1. Definitions of culture and organizational culture	13
2.2. Definition of safety culture	15
2.3. Definition of patient safety culture.....	16
2.4. Patient safety culture versus patient safety climate.....	17
2.5. Subcultures and professional cultures	18
2.6. Assessment of patient safety climate and culture	19
2.7. Connection between patient safety culture and patient safety	21
2.8. Walk Rounds: an intervention to influence patient safety culture.....	23
2.9. The patient safety climate and culture journey in Sweden.....	23
3. AIMS.....	25
4. METHODS	27
4.1. Study setting	27
4.2. Study population	28
4.3. Data collection.....	28
4.3.1. National survey (Study 1)	28
4.3.2. Interviews (Study 2 and Study 3)	29
4.3.3. Walk Rounds evaluation survey (Study 4).....	30
4.4. Data analysis	30
4.4.1. Statistical analysis (Study 1)	30
4.4.2. Qualitative content analysis (Study 2 and Study 3)	31
4.4.3. Mixed-method approach (Study 4).....	31
4.4.4. Ethical considerations	32
5. RESULTS.....	33
5.1. Factors associated with patient safety culture (Study 1)	33
5.2. Patient safety culture among registered nurses and nurse assistants (Study 2)	34

5.3. Professional culture of potential relevance for patient safety among physicians (Study 3).....	36
5.4. Walk Rounds as a means to influence patient safety culture (Study 4)	38
6. DISCUSSION	41
6.1. Discussion of the findings of the four studies.....	41
6.2. Discussion of the study findings in relation to patient safety theories and models	44
6.2.1. Antonsen's three organizational components	44
6.2.2. Patankar's four stages of patient safety culture maturity	45
6.3. Methodological considerations.....	46
6.3.1. Quantitative method (Study 1)	46
6.3.2. Qualitative methods (Study 2 and Study 3)	47
6.3.3. Mixed method (Study 4)	49
6.4. Conclusions	50
6.5. Personal reflections and future research.....	51
REFERENCES	55
APPENDIX.....	65

ABSTRACT

Background: Shared values, norms and beliefs of relevance for safety in health care can be described in terms of patient safety culture. This concept overlaps with patient safety climate, but culture represents the deep-rooted values, norms and beliefs, whereas climate refers to attitudes and more superficial manifestations of culture. There may be numerous subcultures within an organization, including different professional cultures. In recent years, increased attention has been paid to patient safety culture in Sweden, and the patient safety culture/climate in health care is regularly measured based on the assumption that patient safety culture/climate can influence various patient safety outcomes.

Aim: The overall aim of the thesis is to contribute to an improved understanding of patient safety culture and subcultures in Swedish health care.

Design and methods: The thesis is based on four studies applying different methods. Study 1 was a survey that included 23,781 respondents. Data were analysed with quantitative methods, with primarily descriptive results. Studies 2 and 3 were qualitative studies, involving interviews with a total of 28 registered nurses, 24 nurse assistants and 28 physicians. Interview data were analysed using content analysis. Study 4 evaluated an intervention intended to influence patient safety culture and included data from a questionnaire with both fixed and open-ended questions, which was answered by 200 respondents.

Results: A key result from Study 1 was that professional groups differed in terms of their views and statements about patient safety culture/climate. Registered nurses and nurse assistants in Study 2 were found to have partially overlapping norms, values and beliefs concerning patient safety, which were identified at individual, interpersonal and organizational level. Study 3 found four categories of values and norms among physicians of potential relevance for patient safety. Predominantly positive perceptions were found in Study 4 concerning the Walk Rounds intervention among frontline staff members, local managers and top-level managers who participated in the intervention. However, there were also reflections on disadvantages and some suggestions for improvement.

Conclusions: According to the results of the patient safety culture/climate questionnaire, perceptions about safety culture/climate dimensions contribute more to the rating of overall patient safety than background characteristics (e.g. profession and years of experience). There are differences in the patient safety culture between registered nurses and nurse assistants, which imply that efforts for improved patient safety must be tailored to their respective values, norms and beliefs. Several aspects of physicians' professional culture may have relevance for patient safety. Expectations of being infallible reduce their willingness to talk about errors they make, thus limiting opportunities for learning from errors. Walk Rounds are perceived to contribute to increased learning concerning patient safety and could potentially have a positive influence on patient safety culture.

SVENSK SAMMANFATTNING

Bakgrund: Patientsäkerhetskultur kan beskrivas som delade normer, värderingar och uppfattningar om säkerhet i hälso- och sjukvården. Begreppet säkerhetskultur sammanfaller med säkerhetsklimat, men kultur avser mer djupt rotade värderingar, normer och uppfattningar, medan klimat handlar om attityder och mer ytliga aspekter än kultur. I en organisation finns olika subkulturer, varav professionskulturer är en. I Sverige har en ökad medvetenhet om betydelsen av patientsäkerhetskultur vuxit fram de senaste åren. Mätningar av patientsäkerhetskultur/klimat är genomförda i samtliga landsting/regioner i Sverige, eftersom denna kultur/klimat anses vara en viktig del i arbetet för en säkrare vård.

Mål: Det övergripande målet med avhandlingen är att bidra till en ökad förståelse av patientsäkerhetskultur och subkulturer i svensk hälso- och sjukvård.

Design och metoder: Avhandlingen bygger på fyra studier med olika metoder. Studie 1 var kvantitativ och inkluderade 23781 enkätsvar. Studie 2 och 3 byggde på intervjuer med totalt 28 sjuksköterskor, 24 undersköterskor och 28 läkare. Intervjudata analyserades med innehållsanalys. Studie 4 utvärderade en intervention med 200 enkätsvar. Enkäten bestod av både fasta och öppna frågor.

Resultat: Huvudfynd från Studie 1 var att professioner har olika upplevelser av patientsäkerhetskulturen/klimatet. Sjuksköterskor och undersköterskor i Studie 2 har både gemensamma och skilda normer, värderingar och uppfattningar avseende patientsäkerhet, vilka identifierades på individ, grupp och organisationsnivå. Studie 3 identifierade värderingar och normer bland läkare av potentiell betydelse för patientsäkerheten: ofelbar; ansvarstagande; autonom; och teammedlem. I Studie 4 beskrevs övervägande positiva uppfattningar från deltagare i patientsäkerhetsronderna, men även nackdelar och förbättringsförslag identifierades.

Slutsats: Enligt resultatet från mätningar med enkäten "Att mäta patientsäkerhetskultur" är upplevelser av ingående delar i enkäten viktigare för hur patientsäkerheten på enheten upplevs än bakgrundsfaktorer som yrke och antal års erfarenhet. Det finns skillnader i patientsäkerhetskulturen mellan sjuksköterskor och undersköterskor, vilket innebär att insatser för förbättrad patientsäkerhet behöver anpassas efter deras respektive

värderingar, normer och uppfattningar. Flera aspekter av läkarnas normer och värderingar kan ha betydelse för patientsäkerheten. Förväntningar om att vara ofelbar kan minska viljan att prata om egna misstag, vilket begränsar möjligheter till lärande. Patientsäkerhetsronder upplevdes bidra till ett ökat lärande om patientsäkerhet och kan vara ett sätt att påverka patientsäkerhetskulturen positivt.

LIST OF PAPERS

Study 1: Danielsson M, Nilsen P, Rutberg H, Årestedt K. (2017). A national study of patient safety culture in hospitals in Sweden, *Journal of Patient Safety*, doi: 10.1097/PTS.0000000000000369.

Study 2: Danielsson M, Nilsen P, Öhrn A, Rutberg H, Fock J, Carljford S. (2014). Patient safety subcultures among registered nurses and nurse assistants in Swedish hospital care: a qualitative study, *BMC Nursing*, Vol.13:39.

Study 3: Danielsson M, Nilsen P, Rutberg H, Carljford S. (2018). The professional culture among physicians in Sweden –potential implications for patient safety. Submitted to BMC Health Services Research.

Study 4 : Danielsson M, Carljford S , Nilsen P. (2015). Patient safety walk rounds: views of frontline staff members and managers in Sweden. *International Journal of Nursing*, Vol.2(2): 81-93.

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1. INTRODUCTION

Research on patient safety issues has developed rapidly since 1999. The starting point was the Institute of Medicine's report *To Err is Human*, which made the startling comparison that the number of deaths caused by care was equivalent to a jumbo jet (Boeing 747) crashing every day in the USA. Medical errors were estimated to be the 8th leading cause of death although all errors are not considered preventable (Kohn et al., 2000). The report stated that improvement in patient safety required a strong and visible leadership, an organizational culture for learning from errors and modified collective professional norms and expectations. Since the report was published, the concept of patient safety culture has been increasingly addressed in patient safety research and practice. The concept is an adaptation of safety culture, a concept that has been highlighted in reports from the nuclear industry disaster in Chernobyl in 1986. Poor safety culture was identified as the root causes of the accident (International Nuclear Safety Advisory Group, 1986).

This thesis consists of four studies that investigate different aspects of safety culture in health care and the implications for patient safety. Although the interest in safety culture started in the nuclear and airline industries, safety culture has become an increasingly recognized area of interest in relation to patient safety in health care. Culture is usually defined in terms of the shared norms, values, beliefs and assumptions among a social group, i.e. it is a collective phenomenon. In Sweden, patient safety culture has been high on the agenda since 2010. A national initiative from the government and the Swedish Association of Local Authorities and Regions led to the use of a questionnaire that measures patient safety culture in every county council in Sweden during 2011.

My personal interest in patient safety culture stems from my background as an intensive care nurse and my reflections about how we can ascertain the quality and safety of patient care at the sharp end. My later work with regional and national surveys to measure safety culture has raised many questions. The concept of culture, including patient safety culture, is multifaceted and complex. Can we really capture all aspects of the concept with a questionnaire? And do we capture the shared norms, values, etc., or merely individuals' different attitudes and beliefs about patient safety-related issues? To some extent I believe we have a desire to measure everything we believe is important in health care and there is

tremendous interest from authorities and policymakers to measure anything that could potentially yield improved patient safety. We have a strong belief in numbers and figures telling us the “truth”, but do we fully understand the concept to be able to capture it in a survey questionnaire? What if some aspects of culture are subconscious?

The next step after the measurement of patient safety culture regionally and nationally was to handle the results. This raised further questions: what exactly had we measured, what did the results mean and what actions should be taken to influence safety culture on the basis of the results? More questions than answers emerged and I felt we had merely scraped the surface of the safety culture concept. To some extent, I felt that we had gone ahead and tried to measure a concept that we needed to understand better in the rush to improve patient safety. All the questions made me want to find out more about patient safety culture. My belief is that even if it is difficult (or even perhaps impossible?) to measure patient safety culture, it is extremely important that we continue to address culture in health care, ultimately for the sake of the patients and the quality of care that is provided to them.

Many of these questions have directly influenced the studies of this thesis, which deals with patient safety culture but also investigates how subcultures in Swedish health care may have an impact on patient safety. The premise is that safety culture matters for patient safety. The aim of this thesis is to contribute to knowledge for improved understanding of patient safety culture and subcultures in Swedish health care.

2. THEORETICAL FRAMEWORK

This chapter provides an overview of theories and concepts of relevance to the four studies of the thesis. It begins with definitions of culture because this concept is fundamental to the thesis. The chapter continues with the interrelated concepts of organizational culture, safety culture, patient safety culture and patient safety climate. The relevance of subcultures, including professional subcultures, is addressed. The chapter finishes with a section about interventions targeting patient safety culture and the Swedish patient safety culture “journey”.

2.1. Definitions of culture and organizational culture

Culture is a complex concept that has been defined and discussed by many scholars over the years. In the 19th century, Tylor (1871) defined culture very broadly as “the complex whole which includes knowledge, belief, art, law, morals, custom and any other capabilities and habits acquired by man as a member of society”. Although there are numerous definitions of the concept, most agree that culture is created based on the experience of dealing with social situations and that it involves symbols that facilitate interaction. Culture can be considered as unwritten rules in the social life that have been accepted and are considered functional (Geertz, 1973).

There is also wide agreement that culture is learned and derives from one’s social environment. It should be distinguished from human nature on the one hand and an individual’s personality on the other. However, precisely where the “borders” lie between nature and culture and between culture and personality is debated among scholars. Still, there is consensus concerning numerous aspects of the culture concept. Culture is considered a collective phenomenon because it is shared with people who live and/or interact within the same social environment in which it was learned (Hofstede, 2011).

Many definitions of culture describe the concept in terms of shared assumptions (unspoken beliefs and expectations), values (important and lasting ideals and beliefs) and norms (beliefs about how members of a group should behave in a given context) among members of a social environment, which may be a family, a group, a department at work, a profession, an organization or a society. Hence, culture is a collective phenomenon that can be described at different collective levels (Bang, 1999).

Organizational culture has been studied extensively by Schein (1992). He has explained what characterizes culture as follows:

- We learn culture (do not inherit it)
- We share culture (culture is not homogeneous but exists in social contexts)
- Culture is based on symbols (things we understand in the same way)
- Culture is dynamic (it interacts and changes)

Schein (1992) identifies three levels of culture:

- Artefacts: visible elements in the organization such as logos, architecture, structure, processes and clothing
- Espoused values: the organization's standards, rules of conduct, strategies, objectives, philosophies, etc.
- Basic underlying assumptions: "invisible" unconscious and deeply embedded taken-for-granted values and beliefs, which are experienced as self-evident

Schein (1992) particularly emphasizes underlying assumptions that create cognitive stability. These assumptions may be unconscious. He believes that challenges to these assumptions will result in anxiety and defensiveness, which has been suggested as an important reason why many change initiatives fail.

A central debate concerning organizational culture is whether this is something that an organization *has* or something that an organization *is*. The former view suggests that the culture can be changed and used as a "tool" for improvement. In contrast, the latter view means that processes, rules, behaviours, beliefs, norms, etc. of an organization are all part of the cultural life and cannot be manipulated (Lloyd, 2013). In patient safety, it is generally assumed that culture is something an organization *has*, i.e. culture can be influenced.

Safety culture scholar Antonsen (2009) describes organizational culture as "various labels related to work, which usually takes place in an organization, and justify the term organizational culture as an umbrella concept for the various forms of culture in an organization, including occupational or professional culture" (Antonsen, 2009, p. 5).

2.2. Definition of safety culture

The concept of safety culture was introduced to provide an explanation for the Chernobyl nuclear accident in 1986. The investigation showed the importance of the human element in safety because deficient safety culture was identified as the main root cause of the disaster (Waterson, 2014; International Nuclear Safety Advisory Group, 1986). Recognition of the importance of the “soft” aspects of organizations to achieve safety generated an increased interest in the concept of safety culture in the 2000s.

As with many other concepts related to culture, there have been discussions about the meaning of safety culture. Although many scholars agree on key attributes of the concept, there is no one definition on which everyone agrees (Guldenmund, 2000; Flin et al., 2000). Safety culture scholar Antonsen describes three different components in organizations: culture, structure and interaction. Structure consists of the tasks, roles, responsibility and authority and interaction concerns social relationships, communication and cooperation. Both structure and interaction are closely related to the contents of culture. Antonsen argues that organizational culture cannot be studied in isolation from structures and interactions (Antonsen, 2009, p. 45).

Figure 1: Simplification of aspects of organizations and their relationship to safety (Adapted with permission from Antonsen)

Patankar et al. (2012) have described safety culture at different stages of maturity in an organization.

Figure 2: The four safety culture stages adopted from Patankar et al. (2012).

The secretive culture is the lowest maturity level; at this level, safety issues are reactive. There is a lack of trust between organizational levels. In the blame culture, there is still a reactive way of handling safety issues, although they may be known. There is a focus on individuals and punishment. In the reporting culture, employees are used as sources for safety issues and incidents are investigated from a system perspective (instead of a focus on individual shortcomings). At the highest level, just culture, safety is the core of the organization and employees are rewarded for reporting safety issues. The learning achieved is linked to these maturity stages, going from a failure to learn to transformational learning (Patankar et al., 2012).

2.3. Definition of patient safety culture

The next question is: what is patient safety culture? The concept is influenced by the safety culture concept, but it emerged as a concept of its own in the 2000s. It is usually considered a subset of organizational culture, i.e. those aspects of the organizational culture that influence patient safety (Antonsen, 2009). Patient safety culture emerges from the shared assumptions (unspoken beliefs and expectations), values (important and lasting ideals and beliefs) and norms (beliefs about how members of a group should behave in a given context) among members of an organization, unit or team with regard to practices that directly or indirectly influence patient safety (Waterson, 2014; Feng et al., 2008).

Patient safety culture is generally described in terms of being something that can be influenced to achieve safer care. Studies have found five central themes in (or components of) patient safety culture (Flin et al., 2000):

1. Management – commitment to safety and prioritization
2. Safety system – safety policies, incident reporting
3. Risk perceptions and attitudes towards risk and safety
4. Work pressure – workplace and workload
5. Competence – selection and training of workforce

The characteristics of an organization with a positive safety culture in health care have the following features according to a summary by Walshe and Boaden (2006):

- Communication – with mutual trust and openness
- Good information
- Shared perception of safety
- Recognition of the inevitability of errors
- Proactive work and prevention of risks
- Organizational learning
- Committed leadership
- No blame approach to incident reporting

2.4. Patient safety culture versus patient safety climate

The concept of patient safety climate has also gained interest from patient safety scholars in the 2000s. The term has often been used interchangeably with patient safety culture, which has caused a great deal of confusion as how to understand the two concepts. There are important differences between the two concepts. The study of climate and culture in organizations has different origins. Culture has been studied within anthropological research, most commonly with qualitative methods. The study of organizational climate has its origin in social psychology and is often studied using quantitative methods (Haukelid, 2008; Törner, 2008).

Culture and climate are related. However, whereas culture is usually seen as being deeply rooted, having evolved over time, climate represents more superficial manifestations of culture (Schein, 1992). Cox and Flin (1998) have compared culture to an organization's personality and climate to its mood. Culture is more stable over time, whereas climate is assumed to be easier to influence and change than culture.

Another way to describe the relationship between safety culture and safety climate is the safety culture pyramid (Figure 3), which shows that climate is one of several aspects of culture (Patankar et al., 2012).

Figure 3: Safety culture pyramid (Patankar, 2012, p. 2).

Contributing to the confusion concerning the concepts of patient safety climate and patient safety culture, the Swedish guideline for Hospital Survey on Patient Safety Culture applies the term “culture” although most scholars would agree that the instrument in fact measures climate rather than culture. The Swedish definition of patient safety culture according to the guideline is “norms and attitudes within individuals, workgroups that are important for the patient safety” (Att mäta Patientsäkerhetskulturen, 2009, p. 5). This definition contrasts with the general scientific understanding of safety culture as a collective and shared phenomenon.

2.5. Subcultures and professional cultures

It has increasingly been recognized that an organization’s culture does not consist of one homogeneous culture. Rather, it consists of many subcultures that must be studied to develop a deeper understanding of an organization’s culture. Many organizational researchers have argued that organizations rarely possess a single culture, and they have questioned the overemphasis on “organizational” culture (Lloyd, 2013). A subculture in an organization is “a group or unit in an organization that is in frequent interaction, perceives itself to be distinct from other groups in the organization, and that shares similar problems as well as in-group understanding of ways of solving such problems” (Morgan and Ogbonna, 2008).

Studies have shown that patient safety and safety cultures can differ considerably between departments, specialties and professions in hospitals (Singer et al., 2003; Huang et al., 2007; Deilkås and Hofoss, 2010).

Professional subcultures are particularly important in health care because each professional group has different values, norms and behaviours (Hall, 2005). The relevance of professional subcultures in health care has been demonstrated in a few patient safety culture studies (Degeling et al., 1999; Horsburgh et al., 2006; Lok et al., 2011).

Professional subcultures in health care are potentially important from a patient safety point of view because patient safety may be compromised if different professional groups have different values, norms and beliefs that hinder effective communication, learning and teamwork in health care.

Differences between the professional cultures of physicians and registered nurses have often been described in terms of physicians being trained to take charge and assume a role of leadership and responsibility for decisions, whereas registered nurses are more trained to work in teams and collectively work out problems (Reese and Sontag, 2001). Studies have shown that physicians and registered nurses differ with regard to their values and norms concerning adverse event reporting (Scherer and Fitzpark, 2008; Sirriyeh et al., 2012). Research by Ferlie et al. (2005) and Dopson and Fitzgerald (2005) have identified interprofessional boundaries between different professional groups that inhibit spread of new practices. Other studies have shown that professional loyalties may be stronger than those to the organization, which may impede a management's change initiatives, including efforts to improve the patient safety culture (Hillman, 1991; Sutker, 2008; Eriksson et al., 2016).

2.6. Assessment of patient safety climate and culture

Efforts to measure patient safety climate/culture have increased in the last decade. A number of instruments have been developed for this purpose. These instruments vary with regard to their contents and how they define patient safety climate/culture, but the two concepts tend to be used interchangeably. However, the following are common themes, often referred to as dimensions of patient safety culture, in many instruments (Waterson, 2014):

- management commitment to safety
- safety systems
- work pressure
- communication

- teamwork
- non-punitive response to errors
- leadership

The European Network for Patient Safety has recommended three validated instruments that use questionnaires to measure patient safety culture in hospitals after a literature search to identify validated and applied instruments in the European Union. The European Network for Patient Safety literature search identified a total of 19 patient safety culture instruments and recommended the use of three of them (EUNetPaS, 2010):

1. Hospital Survey on Patient Safety Culture, developed by the Agency for Healthcare Research and Quality in the USA
2. Manchester Patient Safety Assessment Framework, developed by the University of Manchester in the UK
3. Safety Attitudes Questionnaire, developed by the University of Texas and Johns Hopkins University in the USA

The Hospital Survey on Patient Culture (AHRQ, 2007) has become the most widely applied patient safety culture questionnaire instrument since it was introduced in 2003. The questionnaire has been adopted for use in over 45 countries, translated into more than 20 languages, including Swedish (Waterson, 2014; Hedsköld et al., 2013). The Hospital Survey on Patient Safety Culture has been used in international research studies. Its psychometric properties have been favourably evaluated in many studies (Waterson, 2014, p. 232-237).

Patient safety culture questionnaires are widely used not only in research but also in practice, where they are seen as an important management tool (Mannion et al., 2009). Surveys can be used to raise staff awareness about patient safety, assess the current status of and trends in patient safety culture, and identify strengths and areas for improvement (Att mäta Patientsäkerhetskulturen, 2009). Patient safety culture has been surveyed regularly in Sweden since 2011 with the Swedish version of the Hospital Survey on Patient Safety Culture.

The Swedish version of the Hospital Survey on Patient Safety Culture differs slightly from the original, featuring seven additional items. The additional items included one further “outcome” question, which concerns the number of reported risks, four questions about information and support to patients and family who have experienced an adverse event, and two questions regarding information and support to staff who have been involved in an adverse event (Hedsköld et al., 2013).

The choice of instrument to survey patient safety culture depends on the purpose of the measurement and resources available (Nieva and Sorra, 2003). The Safety Attitude Questionnaire is another instrument used in Sweden, although to a lesser extent than the Hospital Survey on Patient Safety Culture. The questions in the Safety Attitude Questionnaire belong to dimensions, as in the Hospital Survey on Patient Safety Culture, although there are fewer dimensions (EUNetPaS, 2010). The European Network for Patient Safety has also recommended the Manchester Patient Safety Framework, which differs from the Safety Attitude Questionnaire and the Hospital Survey on Patient Safety Culture in its approach. The purpose of this instrument is to identify by dialogue the level/maturity of the safety culture in an organization according to a model by Parker (Kirk et al., 2007). In Sweden, the Manchester Patient Safety Framework has been mostly used in primary care.

The Hospital Survey on Patient Safety Culture and other patient safety culture measurement instruments may be criticized on the basis of their capacity to actually capture patient safety culture. Measurement with the Hospital Survey on Patient Safety Culture yields results concerning individuals' attitudes and beliefs rather than their shared norms, values or beliefs (Walshe and Boaden, 2006, p. 179), underscoring that the measurement has more to do with patient safety climate than patient safety culture (despite the name of the instrument). Most patient safety culture scholars agree that a deeper understanding of patient safety culture requires qualitative methods to explore the shared norms, values and beliefs among different departments, specialities, professions. However, there is also considerable support for using both surveys based on quantitative instruments and interviews as part of the toolbox for gaining insights into patient safety culture (Nieva and Sorra 2003; Halligan and Zecevic, 2011).

2.7. Connection between patient safety culture and patient safety

The ultimate objective in efforts to influence patient safety culture is to improve patient safety, for example, measured as a reduced number of preventable adverse events. Even though it has often been stated that a poor patient safety culture is the main cause of patient safety problems, it is harder to causally prove that an improved patient safety culture yields better patient safety.

Research has shown that an improved patient safety culture is associated with increased reporting of incidents (Camargo et al., 2012;

Hutchinson et al., 2009) and with patients' and families' perception of quality of care (Alharabi et al., 2014; Dodek et al., 2012). There are also studies concerning team training and communication (usually considered a central part of patient safety culture) showing that methods such as simulation and communication training have an impact on patient safety culture (Brock et al., 2013; Thomas and Galla, 2013; Jones et al., 2013; Van der Nelson et al., 2014).

Research concerning the influence of patient safety culture on various "hard" (numbers) patient safety outcomes has shown that improved patient safety culture reduces the number of blood stream infections (Pronovost et al., 2006). Decreased hospital acquired infections (sepsis, respiratory failures) have been linked to various interventions (simulation training, debriefing of medical emergencies, regular monthly patient safety team meetings, interdisciplinary patient safety conferences) targeting patient safety culture (Braddock et al., 2015). Singer et al. (2009) have demonstrated that the prevalence of pressure ulcers is influenced by patient safety culture.

A review by DiCuccio (2015) provided an assessment of the state of research connecting patient safety culture and patient safety outcomes. The conclusion was that there is a lack of well-designed intervention studies although several of the studies that were included showed an association between patient safety culture and various outcomes. More recently, Lee et al. (2017) presented a review on the relationship between safety culture and quality care outcomes. From the 17 studies included, there was no consistent relationship between patient safety culture and quality outcomes. However, the 17 studies were heterogeneous concerning methods and measures. Braithwaite et al. (2017) indicated similar results in another review.

These findings indicate that the causality between patient safety culture and various patient safety outcomes is not obvious. It is usually assumed that culture (or climate) influences various outcomes, but it may just as well be that knowledge and awareness of favourable outcomes, e.g. reduced numbers of adverse events, contribute to improved patient safety culture.

2.8. Walk Rounds: an intervention to influence patient safety culture

Interventions have been developed with the ambition of improving patient safety culture. Leadership Walk Rounds (also referred to as Patient Safety Walk Rounds and a few other similar names) have been described as a promising intervention to achieve a culture of safety by means of engaging leaders at different levels in patient safety issues. The intervention involves leaders meeting with frontline staff members to discuss patient safety concerns. The basic premise of the intervention is that leaders' visible commitment to patient safety is important in improving patient safety culture (Campbell et al., 2010; Budrevics and O'Neil, 2005; Burnett et al., 2008; Frankel et al., 2008; Zimmerman et al., 2008). The intervention has been compared with management by walking around (Peters and Waterman, 1982), an approach that involves leaders listening, facilitating and reinforcing values by talking to staff and customers (Burnett et al., 2008).

A challenge with patient safety Walk Rounds has been to evaluate the outcome. Studies have examined the number of completed Walk Rounds, which implies a focus on quantity rather than quality. Still, research has shown that Walk Rounds with feedback are associated with better perceptions of safety culture and higher workforce engagement (Sexton et al., 2017).

2.9. The patient safety climate and culture journey in Sweden

Sweden has seen increased use of patient safety climate/culture measurements in recent years. An important rationale for this development is the recognition of patient safety problems in Swedish health care. In 2009, a national study of adverse events in Sweden showed that 8.6% of the patients in hospital care had experienced preventable adverse events (Soop et al., 2009). A preventable adverse event is defined in Sweden as "suffering, physical injury, mental harm, disease or death that could have been avoided with adequate health care actions" (Patientsäkerhetslagen, 2010) (international definitions are broadly similar).

The 2009 study by Soop et al. led to an increased focus on patient safety in general and patient safety culture as a targeted area for improvement. A 4-year national initiative was launched in Sweden in 2011,

in the form of a government-supported financial incentive with the aim of improving patient safety. An important aspect of the initiative concerned measuring patient safety culture. The implementation of this financial incentive was assured by an agreement between the government and the Swedish Association of Local Authorities and Regions. (Patientsäkerhetssatsning, 2012). A version of the Hospital Survey on Patient Safety Culture questionnaire was used that was translated and adapted to a Swedish context and validated (Att mäta Patientsäkerhetskulturen, 2009; Hedsköld et al., 2013). Regular measurement of patient safety culture has been carried out since 2011. The ambition with measurements of patient safety culture during the incentive was to generate knowledge concerning improvement areas and provide the basis for prioritization of efforts to achieve improved patient safety.

The results of the 4-year initiative for improved patient safety in Sweden have not been conclusively evaluated. However, a recent study of adverse events, conducted by Nilsson et al. (2018), showed that the proportion of preventable events was 6–8% during 2014–2016. The study was based on reviews of 64,917 admissions. Although this study suggests improved patient safety, it has reinforced the importance of further efforts for improved patient safety and research concerning patient safety and patient safety culture.

3. AIMS

The overall aim of the thesis is to contribute to an improved understanding of patient safety culture and subcultures in Swedish health care.

The specific aims of the four studies were as follows.

Study 1 aimed to describe and analyse patient safety culture in Swedish hospitals based on a survey of health care professionals and to investigate to what extent factors such as specialties, profession and years of experiences are associated with a favourable patient safety culture.

Study 2 aimed to explore subcultures among registered nurses and nurse assistants in Sweden in terms of their assumptions, values and norms with regard to practices associated with patient safety.

Study 3 aimed to explore physicians' shared values and norms of potential relevance for patient safety in Swedish health care.

Study 4 aimed to investigate Walk Rounds carried out in a Swedish county council in terms of advantages, disadvantages and opportunities for improvement, as perceived by the participating frontline staff members, local unit managers and top-level managers.

4. METHODS

This chapter provides details of the methods used in the four studies of the thesis. The design, study setting, study population and data collection and analysis are described. Ethical considerations are also discussed. Table 1 provides an overview of the methodological approaches used in each of the four studies.

Table 1: Overview of the four studies included in the thesis

Study	Design	Study population and setting	Data collection	Data analysis
1	Survey	23,781 frontline staff members and leaders in Sweden	Questionnaire	Quantitative, descriptive statistics
2	Qualitative interview study	28 registered nurses and 24 nurse assistants at two hospitals in Östergötland	Semi-structured interviews	Qualitative content analysis
3	Qualitative interview study	28 physicians at two hospitals in Östergötland	Semi-structured interviews	Qualitative content analysis
4	Mixed qualitative and quantitative	200 frontline staff members, local unit managers and top-level managers in the County Council of Östergötland	Questionnaire (closed-ended and open-ended questions)	Descriptive statistics and qualitative content analysis

4.1. Study setting

All the studies included in this thesis were undertaken in Swedish health care settings. Health care in Sweden is provided by the 21 county councils and is financed primarily by taxes and to a small extent by patients' fees. Study 1 includes all the county councils in Sweden and the other three were conducted in the County Council of Östergötland (Region Östergötland).

The main part of the studies included only hospital care. Study 1 is based on a national survey also involving primary care, but only results from hospital settings are included. For the interviews in Study 2 and Study 3 the informants were recruited from hospitals. The Walk Rounds

described and evaluated in Study 4 were conducted in both hospital and primary care settings.

4.2. Study population

The national survey (Study 1) targeted staff in various sectors of health care across Sweden. The responders included in the study were managers, registered nurses, nurse assistants, and physicians working in general wards, emergency care or psychiatric hospital care.

For the two qualitative studies (Study 2 and Study 3), participants were recruited from hospital care, by means of a request sent to the head of department. Registered nurses and nurse assistants from four medical wards and four surgical wards at two hospitals participated in Study 2.

For the intervention and evaluation of Walk Rounds (Study 4), the author of the thesis contacted representatives from the top-level management of Östergötland County Council. After agreement to participate in the Walk Rounds, they informed a selection of units about the Walk Rounds. The local unit manager then informed the frontline staff members. Before carrying out the intervention, the top-level managers received a written and oral presentation of the Walk Round.

4.3. Data collection

Data were collected using a national survey questionnaire (Study 1), interviews (Study 2 and Study 3) and a mixed-method including a questionnaire with both fixed responses and open-ended questions (Study 4).

4.3.1. *National survey (Study 1)*

Study 1 used data from the national web-based questionnaires, answered between November 2012 and September 2014. The Swedish questionnaire consists of 48 questions that measure 14 dimensions of patient safety culture, three single-item questions and demographic information (professional group, age, gender, years of working in the hospital, years in health care, specialities and working hour per week). However, Study 1 included only variables from the original questionnaire, 12 dimensions (AHRQ, 2007) (Appendix 1). The response time was during 3 weeks, with some local variation. The Swedish version of the Hospital Survey on Pa-

tient Safety Culture is validated for use in Swedish health care (Hedsköld et al., 2013).

To obtain data from all county councils, access was granted to a database administered by the Swedish Association of Local Authorities and Regions, contact was established and consent was given for the surveys conducted in all hospitals in Sweden. Questionnaires with any data missing were excluded. Three work areas (general wards, emergency care and psychiatric care) and four staff positions (managers, physicians, registered nurses, nurse assistants) were included. The sample consisted of 23,781 participants.

4.3.2. Interviews (Study 2 and Study 3)

In Study 2, the study population consisted of registered nurses and nurse assistants from two hospitals. Information was sent to the manager of each ward with a request to invite registered nurses and nurse assistants for an interview about patient safety. The participants who volunteered to participate were then individually informed. Seven focus group interviews, conducted in accordance with Krueger and Casey (2009), and two individual interviews were conducted with registered nurses, and seven focus group interviews and one individual interview were conducted with nurse assistants.

In Study 3, interviews were conducted with physicians (interns, residents and consultants) employed at two hospitals. Twenty-eight physicians participated in 16 interviews of which 6 were group interviews and 10 were individual interviews. The interns were recruited by means of information sent to their manager (all interns belong to one unit in the organization during their internship) with a request to invite interns for an interview on patient safety. The residents and consultants were invited by the head of department who was informed by the author. The participants who volunteered to participate were then individually informed.

The same semi-structured interview guide (Appendix 2) was used in Study 2 and Study 3. The guide consisted of themes concerning assumptions, values and norms related to patient safety, drawing on inspiration from questions posed in Walk Rounds, as described by Frankel et al. (2003). After an introductory question, “what is patient safety and what does it mean to you?” the interview focused on (a) perceptions of responsibility, (b) situations where mistakes are made, and (c) concerns or worries about patient care.

4.3.3. Walk Rounds evaluation survey (Study 4)

Study 4 used data from 19 Walk Rounds gathered with a questionnaire. At the end of each Walk Round, the questionnaire was distributed (in paper form), and answered before the Walk Round ended. A total of 210 questionnaires were administered to frontline staff members, local managers and top-level managers participating in the Walk Rounds.

The questionnaire was developed by the authors of Study 4 to evaluate various aspects of the Walk Rounds. Questions were inspired by Shaw et al. (2006), Campbell and Thompson (2007) and the Patient Safety Round Team Survey from the Dana-Farber Cancer Institute (2004).

The questionnaire consisted of three fixed-response background questions, 11 fixed-response statements and three open questions concerning the advantages, disadvantages and improvement suggestions of the Walk Round (Appendix 3).

4.4. Data analysis

4.4.1. Statistical analysis (Study 1)

Descriptive statistics were used to present background and patient safety culture dimensions. To compare background characteristics and the reported patient safety culture among the different staff groups, analysis of variance (ANOVA) was used. The next step was to determine the association between the background variables and dimensions of patient safety culture and the outcome, overall patient safety, and then logistic regression analyses were conducted.

The patient safety culture dimensions were entered in the model as continuous variables. Sex was entered as a dichotomous variable and the other background variables in categories. The single item about overall patient safety was the outcome variable and was dichotomized into high (response options “excellent” and “very good”) and low (response options “acceptable,” “fair,” and “failing”) overall patient safety.

In a first step, simple logistic regression analyses were conducted to determine the bivariate association between each explanatory variable and the outcome variable. In a second step, all explanatory variables were entered to determine the multivariate associations between the variables.

The Hosmer-Lemeshow test was used to evaluate the overall goodness of fit of the logistic regression models. All data were analysed with Stata 14.1 for Windows (StataCorp, College Station, TX, USA). Statistical significance was set at $p \leq 0.05$.

4.4.2. Qualitative content analysis (Study 2 and Study 3)

Data from the two interview studies (Study 2 and Study 3) were analysed according to qualitative content analysis as described by Graneheim and Lundman (2004). Content analysis is a technique for analysing texts based on empirical data with an explorative and descriptive character. It entails a structured analysis process to code and categorize the data (Krippendorff, 2012). Manifest content analysis was chosen because it deals with the visible, obvious content, but also allows for a certain level of interpretation (Graneheim and Lundman, 2004).

The analysis was conducted in several steps; after listening to the recordings and reading the transcripts, meaning units were identified. In the next step, the meaning units were condensed and labelled with codes, before being combined into subcategories. From the subcategories, categories were formed. This was an iterative process with several meetings involving all the authors who discussed the categorization until consensus was reached. In Study 3, themes covering the underlying content were identified.

4.4.3. Mixed-method approach (Study 4)

Data from the questionnaire used in Study 4 were analysed using descriptive, comparative and qualitative methods. Background data and responses to the fixed-response items were presented in a descriptive way. Groups were compared using non-parametric tests (Kruskal-Wallis or Mann-Whitney U). Statistical significance was set at $p \leq 0.05$. Statistical analyses were performed using the Statistical Package for the Social Sciences version 22.

Responses to the three open-ended questions, concerning perceived advantages, disadvantages and suggestions for improvement, were analysed using qualitative content analysis (Krippendorff, 2012). Statements were divided according to staff category and were analysed with open coding within the three areas. If similar statements were expressed by five or more of the participants, these were reported as a category in the results.

4.4.4. Ethical considerations

In Study 1, questionnaires were answered individually using a digital system whereby the answers were reported to a database and no personal identification was possible. Interview data (Study 2 and Study 3) were handled confidentially, and the results were presented so that no individuals could be identified. The participants who volunteered were individually informed that they could interrupt their participation at any time without further explanation. Study 4 did not include any sensitive personal information; the results only permitted analysis at a professional level. The questionnaire was answered voluntarily.

Study 1 was approved by the Ethical Review Board in Stockholm (reference number, 2010/820-31/5). Study 2 and Study 3 were approved by the Regional Ethical Review Board in Linköping (reference number, 2012/23-31). Study 4 did not include any sensitive information as defined in Swedish law in the Act concerning the Ethical Review of Research Involving Humans (SFS 2003:460) from the Ministry of Education and Cultural Affairs, therefore no ethical approval was required.

5. RESULTS

In this chapter, the main results of the four studies of the thesis are presented. The full results can be found in the appended papers.

5.1. Factors associated with patient safety culture (Study 1)

Study 1 investigated patient safety culture in Swedish hospitals and to what extent factors such as specialities, profession and years of experience were associated with a favourable patient safety culture (the outcome question). It was found that safety culture dimensions contributed more to overall patient safety than background characteristics, suggesting that these dimensions are important.

The highest rated patient safety culture dimensions were “teamwork within units”, “non-punitive response to error”, “supervisor/manager expectations and actions promoting safety”, and “communication openness”. The lowest rated patient safety culture dimensions were “management support for patient safety” and “staffing”.

Managers scored the highest perceptions in all dimensions. There were significant differences between the staff positions, although ratings from registered nurses, nurse assistants, and physicians were less divergent compared with the managers (Figure 4).

Figure 4: Descriptive analysis for staff positions and the average scores (0-100) for the patient safety culture dimensions

The mean rating for the outcome question “overall patient safety” was 3.3 for all participants (scale 1–5). Managers scored highest on this question and registered nurses scored the lowest overall patient safety. All 12 dimensions of patient safety culture were significantly associated with overall patient safety. Favourable results on the dimensions were associated with higher scores on the overall patient safety question.

Background factors were generally not associated with the overall patient safety score. However, long professional experience (>15 years) implied increased probability for a high score regarding overall patient safety. There was also an association between work areas and overall patient safety. Compared with general wards, the probability for high score regarding overall patient safety increased for emergency care but decreased for psychiatric care (Appendix 4).

5.2. Patient safety culture among registered nurses and nurse assistants (Study 2)

The aim of Study 2 was to explore subcultures among registered nurses and nurse assistants in Sweden in terms of their assumptions, values and norms with regard to practices associated with patient safety. Analysis of the interview data yielded seven categories comprising 16 subcategories (Figure 5).

Levels (Categories)	Registered nurses	Shared	Nurse assistants
Individual •Responsibility •Competence	Reasonable responsibility [Responsibility]	Having experience [Competence] Professional treatment of patients [Competence]	Clear-cut responsibility [Responsibility]
Inter-personal •Cooperation •Communication		Inter-professional support [Cooperation] Appropriate transfer of information [Communication] Open communication about errors [Communication]	Being trusted [Cooperation]
Organizational •Work environment •Management •Routines	Adherence to rules and regulations [Management] Feasible work descriptions [Routines] Low staff turnover [Work environment]	Reasonable workload [Work environment] Engaged and influential leaders [Management] Adherence to routines for error reporting [Routines]	Well-functioning work planning [Management] Adequate physical settings and equipment [Work environment]

Figure 5: Subcategories pertaining to registered nurses and nurse assistants, sorted according to domains (categories) and system levels.

Responsibility: Registered nurses expressed having a reasonable level of responsibility was important for patient safety. They felt that their responsibilities could be too extensive. The nurse assistants perceived that many of their responsibilities were unspecified.

Competence: Both registered nurses and nurse assistants stated that having experience was important for patient safety. Experienced colleagues conveyed a sense of security, and certain capabilities and skills could not be learned without a certain amount of work experience.

Cooperation: The registered nurses and nurse assistants described the importance of support from other professions for patient safety. Interprofessional support between physicians and registered nurses contributed to creating an open climate where the nurses felt they could ask physicians without disturbing them. The nurse assistants described feelings of not being trusted, which they believed could have a negative impact on patient safety.

Communication: Both registered nurses and nurse assistants stressed the importance for patient safety of talking openly about errors, despite the difficulties involved, in order to learn from mistakes. Both groups expressed a belief that transfer of verbal and written information is important to patient safety. They viewed communication as a risk area.

Work environment: Members from both groups stated that workload was associated with patient safety. Registered nurses discussed staff turnover as an important factor that could affect patient safety. Nurse assistants perceived that work conditions in terms of having functional physical settings and proximity to equipment were important for patient safety.

Management: Both groups discussed the importance of having engaged leaders to achieve patient safety. The registered nurses perceived that management adherence to rules and regulations concerning the staff situation was important for patient safety. Short-term problems lead to changes in the local staffing rules, which could jeopardize patient safety.

Routines: Both groups said that the norm was to report when errors occurred although it was inconsistent; errors in some areas were reported more frequently. The registered nurses believed that having written work descriptions is important for patient safety, but having too many written instructions could make it difficult to keep up, leading to problems with adherence.

5.3. Professional culture of potential relevance for patient safety among physicians (Study 3)

The aim of Study 3 was to explore physicians' shared values and norms of potential relevance for patient safety in Swedish health care. Two overarching themes emerged from the interview data, "the competent physician" and "the integrated yet independent physician". The former theme consists of the categories infallible and responsible; the latter theme consists of the categories autonomous and team player (Figure 6). The two themes and four categories expressed physicians' values and norms that create expectations for their behaviours that might have relevance for patient safety.

Theme	Category
The competent physician	Infallible
	Responsible
The integrated, yet independent physician	Autonomous
	Team player

Figure 6: Themes and categories presented in the results section.

Infallible: The physicians described values and norms associated with expectations of being flawless and never making any errors. They were aware that such expectations could negatively affect their willingness to have open dialogue about any mistakes they make and learning from errors.

Responsible: The physicians perceived expectations to assume responsibility for patient safety as part of their professional role. However, they were aware that their actions or decisions might not always be in accordance with the ideals of safe care delivery, thus jeopardizing patient safety.

Autonomous: The physicians described expectations of acting independently because of the profession's special authority over specific areas of expertise and their high degree of status. They considered patient care to be their first and foremost obligation. A certain degree of scepticism concerning adverse event reporting was conveyed due to an individual focus on errors and feelings of punishment and blame. Autonomy was also expressed in terms of wanting to be independent professionals who demonstrate confidence in their work and abilities, which is incompatible with asking for help with specific issues or having too many questions.

A team player: The physicians expressed that they are expected to be involved in team work and be a member of multi-professional teams. They described that when their role in the team was clear and well defined, it created a comfortable and secure environment where it was easier to ask questions. However, they also described situations where they were not an obvious part of the team, which produced feelings of uncertainty. They argued for increased interprofessional collaboration and communication although they commented that not all physicians might

appreciate such a development because it could challenge their sense of authority by forcing them to leave their comfort zone.

5.4. Walk Rounds as a means to influence patient safety culture (Study 4)

Study 4 sought to investigate Walk Rounds in terms of advantages, disadvantages and opportunities for improvement, as perceived by the participating frontline staff members, local unit managers and top-level managers. The participants expressed predominantly positive perceptions of the Walk Rounds. There were very few low ratings for any of the three areas:

- Experiences of the current Walk Rounds
- Beliefs concerning the potential of Walk Rounds to have an impact on patient safety
- Beliefs regarding how repeated Walk Rounds might have an impact on frontline staff members' cognition concerning patient safety and risks.

Frontline staff members and local unit managers placed higher value on the participation of top-level managers than the top-level managers did. Frontline staff members, to a higher degree than the top-level managers, saw the impact of Walk Rounds in terms of increased possibilities to identify risks and believed Walk Rounds could increase the possibilities of offering safe care for patients. Top-level managers to a higher degree than local unit managers believed that repeated Walk Rounds could lead to increased concern for patient safety problems. For this item, there was also a difference between frontline staff and local unit managers with frontline staff scoring higher (Appendix 3).

Six types of advantages (i.e. categories) associated with the Walk Rounds were identified. The Walk Rounds could (1) facilitate open and interactive communication about patient safety and risk issues; (2) give shared impressions of everyday patient safety work; (3) generate an increased awareness of issues of patient safety and risk; (4) enable an outside perspective on issues of patient safety and risk; (5) put a value on accounting for the patient perspective on patient safety in the dialogue and (6) increase involvement of all frontline staff members in patient safety issues and an increased emphasis on patient safety.

Four types of disadvantages (i.e. categories) associated with the Walk Rounds were expressed: (1) time-consuming; (2) doubts about the value or the capability of the Walk Rounds to actually improve patient safety; (3) concerns that the dialogue and communication during the Walk Rounds provided a fragmented and incomplete picture of patient safety and risks in the organization; and (4) unrealistic expectations on leadership to improve patient safety.

The last open question concerned thoughts about how the Walk Rounds could be improved. Three types of categories for improving the intervention were identified; (1) improved structure regarding preparation for the Walk Rounds by clarifying the specific purpose of the Walk Rounds; (2) longer duration of the Walk Rounds; and (3) more frequent Walk Rounds to allow for more feedback on issues of patient safety and risk.

6. DISCUSSION

The aim of the thesis was to generate knowledge for improved understanding of patient safety culture and subcultures in Swedish health care. This chapter begins with a discussion on the results of each of the four studies. This is followed by a discussion on the findings in relation to some of the theories and models described in the Theoretical Framework chapter. The chapter then addresses methodological considerations and summarizes the conclusions. Finally, implications of the studies are described and some ideas for future research are presented.

6.1. Discussion of the findings of the four studies

Study 1 aimed to investigate various aspects of patient safety culture, using the established survey questionnaire, Hospital Survey on Patient Safety Culture. The highest scoring patient safety culture dimensions were “teamwork within units”, “non-punitive response to error”, “manager expectation and actions promoting safety”, “communication openness” and “feedback and communication about errors”. Overall, the results were consistent with other findings concerning areas of strengths in patient safety culture (Vlayen et al., 2012; Wagner et al., 2013).

“Staffing” was one of the lowest rated dimensions and has been identified as one of the dimensions of patient safety culture that is most strongly associated with overall patient safety (Olsen, 2007). Research demonstrates strong connections between staffing and various patient safety outcomes (Aiken et al., 2014). The relevance of staffing for patient safety culture and patient safety outcomes underscores the importance of work environment conditions for patient safety (Welp et al., 2016; Kuntz et al., 2014; Törner et al., 2013). The dimension “manager expectation and actions promoting safety” was rated highly, whereas “management support for patient safety” was the lowest rated dimension. The respondents appeared to be fairly content with what is carried out at department level, but their perception was that top-level managers could do more to support patient safety. Responders’ perceptions are just one side of the picture; perceptions from different levels in the organization need to be shared to gain more understanding/knowledge.

The managers scored all dimensions and overall patient safety higher than registered nurses, nurse assistants and physicians. This pattern has

been shown previously (Nordin et al., 2013; Singer et al., 2003). However, the multivariate regression model revealed a different picture. The odds ratio for high overall patient safety was higher for nurse assistants and for physicians compared with managers, indicating that underlying factors other than having a manager position were associated with a perception of high overall patient safety. For rating the outcome question (perception of general patient safety at the unit), age, professional experience and weekly working time seem to be less important than the content of the perceptions in the dimensions.

Study 2 sought to explore patient safety subcultures among registered nurses and nurse assistants based on interviews. Seven patient safety culture categories were identified: responsibility, competence, cooperation, communication, work environment, management and routines. The study found differences in patient safety culture of the two professions. These findings are consistent with research that suggests that health care organizations comprise disparate professional subcultures (Scott et al., 2003).

Five of the categories identified in Study 2 (cooperation, communication, work environment, management and routines) are represented in recommended and commonly used instruments for measuring patient safety culture (EUNetPaS, 2010). However, two of the categories (responsibility and competence) are not explicitly addressed in these instruments, but could possibly contribute to a more complete picture.

The seven categories identified in the study corresponded with three system levels: individual, interpersonal and organizational levels. The findings underscore the relevance of applying a system perspective to patient safety culture. Other studies have identified similar levels concerning safety culture (Singer et al., 2009; Feng et al., 2008).

The aim of Study 3 was to explore the professional culture of physicians in terms of values and norms that may have relevance for patient safety. The physicians expressed values and norms concerning expectations for infallibility, which they seemed to view as a burden and which contributed to a reluctance to discuss errors. Although the system perspective has become the “espoused theory” of patient safety today, the “theory-in-use” among many physicians was found to be more individualistically oriented. Other studies have described a “culture of perfection” among physicians, which means that errors are viewed as personal failures (Berger et al., 2013; Parry et al., 2009).

Values and norms associated with being autonomous could create goal conflicts with regard to efforts for improved patient safety. The physicians viewed organizational goals as secondary to their own patient focus and medical decision making. Research has shown that physicians are more sceptical about adverse event reporting than other professional groups in health care (Perez et al., 2014; Tricarico et al., 2017). The perceptions of values and norms described in Study 3 of not making any errors, responsibility for the patient's safety and their feelings of individual focus on errors could be an explanation for this.

The physicians expressed values and norms associated with expectations of being interprofessional team players; it was difficult to live up to this role, because of a conflict between their traditional role as "soloists" who work independently and their role as team members. Teamwork and well-functioning communication are commonly described as key factors in achieving improved patient safety (Eriksson et al., 2016).

Study 4 sought to investigate various aspects of the Walk Rounds intervention carried out in a county council, on the basis of a questionnaire to three categories of participants: frontline staff members, local unit managers and top-level managers. The participants were generally positive to the intervention. They believed that Walk Rounds could have an impact on patient safety. The findings lend some credence to the predominantly optimistic picture of the potential of Walk Rounds in the patient safety literature (Budrevics and O'Neil, 2005; Frankel et al., 2008; Zimmerman et al., 2008; Lim et al., 2014).

All groups believed the intervention facilitated open and interactive communication and made it possible to share impressions of everyday safety work. Walk Rounds have been found to expand communication channels and increase collaborative efforts among staff and leaders (Verschoor et al., 2007). Advantages that have not been highlighted in previous research were the beliefs that Walk Rounds provided an opportunity to account for the patient perspective and allowed for an outside perspective of issues on patient safety and risk. Walk Rounds could potentially facilitate individual and organizational learning of benefit to patient safety.

An important finding was the doubts raised about the value of the intervention as an instrument to achieve safer care. Research has shown that Walk Rounds could in fact have a negative impact on the frontline staff members' willingness to work with improvements if the issues addressed do not lead to any solutions (Tucker and Singer, 2012). Hence, it

is what happens after the Walk Rounds that is important (Sexton et al., 2017). The top-level managers expressed concern that the Walk Rounds might create unrealistic expectations on leadership to improve patient safety. To avoid false hopes and disappointment, Rotteau et al. (2014) have recommended that expectations concerning Walk Rounds should be articulated in advance.

6.2. Discussion of the study findings in relation to patient safety theories and models

For improved understanding of the study results, they can be discussed in relation to some of the theories and models presented in the theoretical framework chapter of the thesis: three different components in organization (Antonsen, 2009) and safety culture maturity (Patankar et al., 2012).

6.2.1. Antonsen's three organizational components

Antonsen describes three integrated components in organizations, culture, structure and interaction, which provide a framework for discussing the results. The results from Study 2 and Study 3 show that structure and interaction are important for safety culture.

Structure: The registered nurses in Study 2 perceived their tasks to be difficult to delimit and the nurse assistants talked about their tasks not always being appreciated or valued by the other professions. In comparison, the physicians in Study 3 described their professional tasks as not always aligning with the rules and circumstances provided by the management. Registered nurses described how actions from managers, when they deviated from rules affecting values in patient safety, actually undermined the safety culture among staff.

Interaction: Communication was perceived as important by physicians, registered nurses and nurse assistants. Social interactions were described as supporting, but they can also be difficult among all professions because of how the work is planned and the schedules that affect cooperation between different staff groups. Communication and exchange of information are key aspects of interaction, and were perceived as important for patient safety by registered nurses and nurse assistants in Study 2. The physicians in Study 3 described the team member role as somewhat difficult because of their traditional role as “soloists”. Physicians do not work as closely together with colleagues as registered nurses do. This allows the

registered nurses to develop a close collaborative practice that is impossible to achieve with physicians whose work tasks and duties make it difficult for them to fully belong to interprofessional teams. Interaction can also be characterized by trust; the physicians in Study 3 described their trust in the registered nurses, something that the registered nurses also felt (in Study 2).

Antonsen believes the question of how safety culture influences patient safety is an empirical question, although culture cannot be studied in isolation from structure and interactions in an organization. The results from Study 2 and Study 3 point to the importance of both interactions and structures for safety culture.

6.2.2. Patankar's four stages of patient safety culture maturity

The results of the four studies can also be discussed in relation to Patankar's model of four stages of patient safety culture maturity: secretive culture, blame culture, reporting culture and just culture (Patankar et al., 2012).

Many of the results have elements of a secretive culture (safety issues are reactive and a lack of trust between levels), as described by Patankar. The nurse assistants in Study 2 expressed feelings of not being fully trusted by the other professions. The top-level managers in Study 4 were concerned that staff expectations for patient safety improvements after Walk Rounds would not be met. The physicians in Study 3 expressed values and norms concerning expectations for infallibility and seemed to view this as a burden because it restricts learning from errors. Registered nurses in Study 2 perceived responsibility for their own tasks but also took on responsibility for tasks that they considered to belong to the nurse assistants and the physicians.

The findings also point to the presence of a blame culture. There is knowledge about the incident reporting system, but it is not used to the extent that it could. Many hesitate to report because of what they perceive as an individual focus. Registered nurses, nurse assistants and physicians in Study 2 and Study 3 described difficulties talking about errors although there is existing knowledge that such conversations could be a source for learning.

Further, there are also elements of a reporting culture in the findings. The Walk Rounds were experienced as an opportunity for open and inter-

active communication about risks and errors, and might be a tool for further development of safety culture maturity. Achieving feedback and open communication about errors are important for further efforts for improved patient safety culture. Both registered nurses and nurse assistants expressed that the norm was to report errors when they occurred.

However, the study findings do not suggest that there is a just culture yet. Safety cannot be said to be at the core of the organizations studied. There are no results that support that reporting safety issues is rewarded. Still, there are some positive indications. For example, the registered nurses perceived a great deal of trust from the physicians in Study 2 and the dimension teamwork within the units was the highest rated dimension in the national patient safety culture survey in Study 1. These are signs of positive development and need to be addressed in further efforts to improve patient safety culture.

Overall, the studies point to health care in Sweden not having reached the highest level, i.e. just culture, as described in Patankar's model of four stages of patient safety culture maturity. Hence, safety is not really the core of the organization and employees are not rewarded for reporting safety issues.

6.3. Methodological considerations

All studies in this thesis have methodological limitations that should be taken into account when interpreting the findings and conclusions. In this section, key methodological considerations of the studies are addressed. Study 1 used a quantitative method (questionnaire), Study 2 and Study 3 relied on interviews, and Study 4 used a mixed-method approach by combining analysis of fixed-response statements and open questions in a questionnaire.

6.3.1. Quantitative method (Study 1)

In the quantitative Study 1, the dataset was large although we do not know anything about the individuals who did not answer the questionnaire. The study has shortcomings concerning the high number of missing data; only complete questionnaires with no missing data were included. Despite this, the final sample was large enough to conduct the binary logistic regression analyses.

The study investigated patient safety culture in hospitals with a focus on registered nurses, physicians and nurse assistants. For a more complete picture of patient safety culture, further studies must be conducted for other staff categories. The data were obtained from the second measurement of patient safety culture conducted in all county councils, however we do not know anything about the specific contexts because the sample was collected over a 23-month period in the 21 different county councils.

The reliability of the original version of the questionnaire has been tested by the researchers who developed the instrument (Sorra and Dyer, 2010). The psychometric properties have been tested for the Swedish version (Hedsköld et al., 2013).

The questionnaire supposedly measures patient safety culture, but many patient safety culture/climate scholars would argue that the questionnaire actually measures patient safety climate (please see the discussion in Chapter 2).

6.3.2. Qualitative methods (Study 2 and Study 3)

To gain a better understanding of the values and norms concerning patient safety, qualitative research methods were chosen for Study 2 and Study 3.

The informants in Study 2 were asked to participate by their manager. The researcher had no influence on who participated; those who worked on the proposed day and volunteered were included. Another limitation was that two of the groups consisted of only two informants. When four or more informants accepted participation, the interviews went ahead even if only two people showed up. All interviews were included in the analysis. To strengthen the content validity, several discussions were held between four of the authors during the analysis process.

The sample in Study 3 was recruited by managers in some cases and in other cases, the first author was provided with the names of persons to be contacted. The interview data in Study 3 were gathered using both group interviews and individual interviews. At the start, only group interviews were planned but it was not feasible to accomplish this. The mix of individual and group interviews may have negatively influenced the trustworthiness. According to Lambert and Loisel (2007), integration of individual and group interviews can contribute to greater understanding, but such an approach should not be done ad hoc. The mix of individual

and group interviews may have had a positive contribution to the data, although it would have been easier if it was planned from the beginning.

In Study 3, themes were identified by interpretation of the categories and not obviously expressed by the informants. Ideally, an observer should have been present during the interviews in Study 3 to strengthen the quality of the interviews. Due to short notice in planning the physician's interviews, no observer was available, which may have a negative effect on the credibility.

Qualitative research is limited regarding its relevance and generalizability to other settings and populations. The study sample in Study 2 and Study 3 could differ from the population of physicians, registered nurses and nurse assistants in general due to the number of participants and the specific context. Instead of statistical generalization, qualitative studies typically seek analytical (also known as theoretical) generalization by comparing findings with other studies.

In both Study 2 and Study 3, expressing questions about values and norms were challenging. These terms may not be easily understood or interpreted similarly by informants. Instead, we “operationalized” with questions that dealt with thoughts about patient safety-related responsibility, making mistakes and concerns about patient care.

In qualitative studies, the concepts of credibility, transferability, dependability and confirmability are usually applied instead of validity and reliability. Some reflections concerning these terms in Study 2 and Study 3 are described here.

The credibility in Study 2 and Study 3 will be influenced by the research team's experiences in health care. The first author has been working in health care as a registered nurse for several years and has preconceptions and perceptions of the relevance of values, norms and assumptions about patient safety. However, the research team consisted of researchers from different professions and not everyone had a health care background. All interviews were recorded and transcribed for reducing interpretation although it is always a part of interpretations during the analytical process. The quotes were chosen as a way to strengthen the credibility (Graneheim et al., 2017).

The transcriptions of all interviews were read several times. During the reading, missing words were added for the dependability. To gain dependability of the data, content analysis was chosen for the analysis pro-

cess because the research team have experience of this method and the first author has participated in two training courses on content analysis.

The confirmability, i.e. the ability to be neutral about the data, can be discussed in relation to my dual role as researcher and practitioner. My research area is an essential part of my work. The studies in the thesis have been conducted over 6 years. During this period I have been working with patient safety culture issues in the County Council of Östergötland and at national level for the Swedish Association of Local Authorities and Regions. This experience has more than likely influenced my research a great deal, not least the choice of topics and issues to investigate. Combining practitioner and researcher roles has both negative and positive effects. The challenge is to avoid preconceptions and be as neutral and objective as possible regarding the results, but an advantage is access to settings where the research is conducted and familiarity with the topic. During the analytical process in the qualitative studies (Study 2 and Study 3), the research teams held several meetings and some interviews were read by all authors to avoid subjective interpretation of the data.

6.3.3. Mixed method (Study 4)

A limitation in Study 4 was that, for practical reasons, the questionnaire was not subjected to a formal validation or reliability testing. However, the questionnaire was inspired by similar instruments, an experienced survey expert was consulted for the development, and the questionnaire was pilot tested. Despite this, some of the statements in the questionnaire were found to have a ceiling effect, because the answers were more positive than expected.

The inclusion of open-ended questions was a way to add to the quantitative findings and gain a deeper understanding of the issue being studied. The open-ended questions yielded quotes that could also be said to validate the quantitative findings (explain the results from the fixed questions), which was considered important due to the limited data (Burke Jonsson and Onwuegbuzie, 2004). It is a challenge with mixed-method approaches if the quantitative and qualitative results point in different directions. However, the qualitative and quantitative findings “agreed” in Study 4.

6.4. Conclusions

This thesis contributes to improved understanding of patient safety culture and subcultures in Swedish health care. This knowledge may be useful in future work with patient safety culture in health care in Sweden. The main conclusions from the studies are as follows.

Study 1: The safety culture dimensions from the survey questionnaire (Hospital Survey on Patient Safety Culture) contributed more to overall patient safety than the background characteristics (specialties, profession and years of experiences). This suggests that these dimensions are very important in efforts to improve the overall patient safety culture.

Study 2: Registered nurses and nurse assistants in Sweden differ with regard to patient safety subcultures, i.e. their assumptions, values and norms with regard to practices that influence patient safety. Well-functioning routines, managers who adhere to rules and appropriate work environments were valued organizational-level factors. Communication about patients and errors was considered important at the interpersonal level. Adequate responsibility and competence were highlighted at the individual level.

Study 3: There are several aspects of physicians' culture that may have relevance for patient safety. Expectations of being infallible reduce physicians' willingness to talk about errors they make, generating a "culture of silence" that limits opportunities to learn from errors. The autonomy of the physicians is associated with expectations of acting independently and the physicians use their decisional latitude to determine the extent to which they engage in patient safety-enhancing initiatives and activities. The physicians perceived that organizational barriers make it difficult to live up to expectations to assume responsibility for patient safety. Similarly, expectations of being part of multi-professional teams were deemed difficult to fulfil, potentially inhibiting communication of importance to achieve improved patient safety.

Study 4: Walk Rounds developed for use in a Swedish county council on the basis of descriptions in the literature were perceived to have many advantages, according to frontline staff members, local managers and top-level managers who participated in the intervention. The frontline staff expressed the most positive views, based on both quantitative and qualitative data. They believed that the Walk Rounds enhanced the focus on patient safety and led to increased involvement. All groups believed the intervention facilitated open and interactive communication and made it

possible to share impressions of everyday safety work. An advantage of the Walk Rounds that has not been previously highlighted was that they provided an opportunity to account for the patient perspective. The Walk Rounds were perceived to have the potential to contribute to increased learning concerning patient safety and to influence patient safety culture.

6.5. Personal reflections and future research

The thesis provides knowledge concerning some aspects of the patient safety culture in Sweden. Achieving safer care is a continuous, never-ending mission with no easy or quick “fixes”. However, I believe an improved understanding of the culture and subcultures of patient safety are important because it contributes to on-going knowledge accumulation and development of the field and practice. The knowledge generated can be used as a basis for developing and implementing “solutions” (efforts, interventions, etc.) aimed at improving patient safety culture.

My main supervisor often says that practitioners tend to look for “solutions” to improve health care, whereas researchers focus on understanding and explaining “problems”, before they deal with potential solutions (e.g. interventions), which must be evaluated with scientific rigor. There is some truth in this observation. We cannot jump to conclusions and “solutions” before we have an in-depth understanding of the problems.

Measurements of patient safety culture have created and increased awareness about this aspect of patient safety. While there is no single definition of patient safety culture that everyone agrees upon, there is agreement about its importance for patient safety. Perhaps the most important part of the measurements is the dialogue based on the results. The instrument is complex and there are many measurement challenges, but sometimes I wonder if we focus too much on all the details and nuances of the instruments we use. We do not need another culture survey, as has been suggested by Ginsburgh et al. (2013), but we could probably have use for an instrument to capture the staff’s perceptions about patient safety and work environment to keep the dialogue alive. Still, I think there is a risk that we measure too many things, not really knowing what matters most for patient safety. Numbers and figures from measurements always need to be contextualized and adapted to the local circumstances.

I believe it is important for patient safety climate/culture to define responsibilities for different professions. From the results in the thesis, this

responsibility does not seem to be clearly defined, which can be overwhelming for those individuals and professions that take on too much responsibility. The competence of the different professions needs to be used more effectively, which requires more clearly defined responsibilities.

For the most part, health care in Sweden is functional. Still, we cannot consider health care “safe”. We must learn from our lapses and mistakes so they are not repeated. Otherwise we are not faithful to the patients. One way to learn from mistakes is to share them by dialogue. Mistakes that are shared should be honoured by supporting managers and reported events that others can learn from highlighted. We are allowed to make mistakes, but we should not make the same mistake twice.

Another dialogue of relevance for patient safety is that between staff and top-level managers. Management creates conditions for safety and the actions influence the values, norms and assumptions, i.e. the culture, in the organizations. Staff and top-level managers need to meet to understand and learn from each other’s perspectives/pictures of reality. Walk Rounds may be a tool for such a dialogue if they are repeated and involve feedback.

I believe it is also important to account for the influence of informal leaders on patient safety. In health care, physicians are important informal leaders (and many of them are also managers). Leadership is a broader concept than management because it involves influence processes with a wide range of people, i.e. not just those who have a managerial role. To what extent is physicians’ culture (i.e. their shared values, norms and assumptions) aligned with that of the managers or the other professions in health care? To what extent do physicians take part in management initiatives for improved patient safety?

The groundbreaking report *To Err is Human* described a need for improvement concerning the culture for learning from errors (Kohn et al., 2000). The report was published nearly 20 years ago, but this conclusion is still highly relevant in health care, an organization characterized by a great deal of inertia. Changes in patient safety culture and in professional subcultures can be assumed to take time. From a longer term perspective, the patient safety improvement journey has only just begun. And it is a journey that never ends.

Numbers and figures are important to understand the magnitude and characteristics of the problem, but linking this “diagnosis” to the most relevant “treatment” provides a profound challenge. We measure many

things in health care and put a lot of faith in the measurements, but we have to recognize that all these numbers and figures do not provide us with the “solutions”. I believe we must engage in a continuous dialogue between management, leaders and staff in health care organizations to influence the values and norms that may impact on expectations and actions concerning patient safety. Influencing patient safety culture is based on “doing” rather describing or documenting it in words or numbers. Research can provide a platform for understanding and explaining phenomena but will not deliver conclusive answers to all our questions or challenges concerning safety culture and patient safety.

Managers’ perceptions have not been studied. Their perspective could provide a more complete picture of patient safety climate and culture. It is also important to study the influence of informal leaders, who are often physicians in health care. However, a research challenge to account for the importance of leadership is to identify and gather information from and about those who are leaders since “leader” is not an official title, unlike “manager”. Informal leaders often have a critical role in health care.

It is also important to carry out research that accounts for the patients’ views on patient safety. What is important from their perspective? How can they help health care practitioners? To what extent do they feel involved in matters of relevance for patient safety?

Health care in Sweden has been exposed to substantial changes in recent decades. The development in health care is rapid and the opportunities for care and treatment are improving although resources are limited. The concept of “change fatigue”, i.e. feelings of stress and fatigue associated with changes in the workplace has been addressed in relation to organizational changes, but few studies exist in health care to investigate how this fatigue affects the quality and safety of care. The lack of registered nurses has become a concern in health care in Sweden today. Research is needed on how the work environment influences patient safety.

Research concerning interventions that may have an impact on the patient safety climate/culture is important. Studies are needed to evaluate how Walk Rounds affects various outcomes before the intervention can be more widely recommended as a tool. Both qualitative and quantitative research is needed.

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APPENDIX

APPENDIX 1

Study 1 Distribution of Questionnaires by Staff Group and the Dimensions in the Hospital Survey on Patient Safety Culture

Respondent Characteristics	All Participants (n = 23,781)	Managers (n = 2015)	Registered Nurses (n = 12,145)	Enrolled Nurses (n = 5460)	Physicians (n = 4161)	P Value	Post Hoc (Bonferroni Corrected) ^a
Sex, n (%)						<0.001	
Male	5512 (23.2)	506 (25.1)	1543 (12.7)	1052 (19.3)	2411 (57.9)		
Female	18269 (76.8)	1509 (74.9)	10602 (87.3)	4408 (80.3)	1750 (42.1)		
Age, n (%)						<0.001	
18-34 years	5362 (22.6)	57 (2.8)	3635 (29.9)	884 (16.2)	786 (18.9)		
35-54 years	13017 (54.7)	1287 (63.9)	6395 (52.7)	2928 (53.6)	2407 (57.9)		
>55 years	5402 (22.7)	671 (33.3)	2115 (17.4)	1648 (30.2)	968 (23.3)		
Professional experience, n (%)						<0.001	
<5 years	3517 (14.8)	43 (2.1)	2413 (19.9)	524 (9.6)	537 (12.9)		
6-15 years	7329 (31.1)	316 (15.7)	3957 (32.6)	1529 (28.0)	1590 (38.2)		
>15 years	12872 (54.1)	1656 (82.2)	5775 (47.6)	3407 (62.4)	2034 (48.9)		
Weekly work time, n (%)						<0.001	
<20 hours	372 (1.6)	18 (0.9)	192 (1.6)	127 (2.3)	35 (0.8)		
20-39 hours	11628 (48.9)	153 (7.6)	7389 (60.8)	3745 (68.6)	341 (8.2)		
40-59 hours	11283 (47.5)	1753 (87)	4536 (37.4)	1564 (28.6)	3430 (82.4)		
≥60 hours	498 (2.1)	91 (4.5)	28 (0.2)	24 (0.4)	355 (8.5)		
Work areas, n (%)						<0.001	
General wards	14306 (60.2)	1253 (62.2)	7287 (60.0)	2741 (50.2)	3027 (72.7)		
Emergency care	5976 (25.1)	392 (19.5)	3500 (28.8)	1327 (24.3)	757 (18.2)		
Psychiatry care	3499 (14.7)	370 (18.4)	1358 (11.2)	1392 (25.5)	379 (9.1)		
Patient safety culture dimensions, mean (SD)							
Communication openness	66.3 (17.9)	79.8 (13.7)	65.3 (17.3)	64.5 (18.8)	64.9 (17.8)	<0.001	ABCD--
Feedback and communication about errors	64.8 (20.3)	75.7 (15.8)	65.0 (19.7)	65.7 (20.5)	57.8 (21.1)	<0.001	ABC-EF
Handoffs and transitions	58.2 (18.2)	63.9 (17.6)	59.1 (17.3)	58.9 (17.9)	51.7 (20.0)	<0.001	ABC-EF
Management support for patient safety	47.9 (24.1)	65.2 (22.5)	44.4 (23.3)	49.0 (22.9)	48.0 (25.1)	<0.001	ABCDE-
Non-punitive response to errors	67.2 (21.7)	84.1 (16.0)	67.0 (21.2)	64.3 (22.0)	63.4 (21.3)	<0.001	ABCDE-
Organizational learning	61.5 (19.1)	74.9 (14.4)	59.9 (18.9)	61.5 (18.9)	59.7 (19.6)	<0.001	ABCD-F
Overall perception of patient safety	58.0	71.3	55.8	58.7	57.1	<0.001	ABCDEF

	(22.0)	(17.2)	(22.1)	(21.7)	(21.6)		
	51.9	65.7	51.4	49.9	49.4		
Staffing	(22.2)	(21.0)	(22.3)	(21.8)	(20.8)	<0.001	ABCDE-
Supervisor/manager expectations and actions promoting safety	66.7	78.2	65.7	67.3	63.5	<0.001	ABCDEF
	(21.6)	(16.3)	(21.8)	(21.9)	(21.4)		
Teamwork across units	57.1	65.0	56.2	56.6	56.5	<0.001	ABC---
	(17.4)	(16.6)	(16.9)	(17.0)	(19.0)		
Teamwork within units	73.5	81.2	74.1	71.8	70.4	<0.001	ABCDEF
	(17.1)	(13.3)	(16.4)	(17.7)	(18.5)		
Frequency of events reported	54.4	62.0	53.5	58.2	48.3	<0.001	ABCDEF
	(22.0)	(18.6)	(21.4)	(23.5)	(21.1)		
	3.3	3.7	3.2	3.3	3.3	<0.001	ABCDE-
Overall patient safety, mean (SD)	(0.9)	(0.7)	(0.9)	(0.9)	(0.9)		

^aSignificant difference between staff groups are marked with: A, managers/registered nurses; B, managers/enrolled nurses; C, managers/physicians; D, registered nurses/enrolled nurses; E, registered nurses/physicians; F, enrolled nurses/physicians.

APPENDIX 2

Interview guide (Study 2 and Study 3)

Information before beginning the interview

An interview concerning patient safety

Interested in your perceptions

The interview is recorded

All material will be presented anonymously

Presentation of the participants (name, age and year in this speciality)

Opening question

Your thoughts when you read the information about the interview, what is patient safety to you?

Interview questions

How do you feel about the responsibility concerning safe care for patients at your unit?

...Why?

... Specific responsibilities for your professional group?

What are the concerns about safety for the patients?

....why?

...how?

What happens if you make a mistake?

....why?

...how?

What would you like to do to increase safety for the patients?

....why?

...how?

Do you have other thoughts about patient safety that we haven't talked about?

APPENDIX 3

Questionnaire fixed answers (Study 4)

Item	Top-level managers, n	Local unit managers, n	Frontline staff members, n	Total n (%)	Positive answers, proportion*
What was the merit of having top-level managers representatives taking part in today's Walk Round?					
Poor	0	0	0	0	99%
Fair	1	0	0	1 (0.6)	
Good	11	3	11	25 (13.8)	
Very good	29	45	81	155 (85.6)	
How do you think Walk Rounds could have an impact on...					
...identifying patient safety risks?					
Decrease greatly	0	0	0	0	92%
Decrease somewhat	0	0	0	0	
No difference	5	1	9	15 (8.1)	
Increase somewhat	37	39	52	128 (68.8)	
Increase greatly	5	8	30	43 (23.1)	
...offering safe care for the patients?					
Decrease greatly	0	0	0	0	89%
Decrease somewhat	0	0	0	0	
No difference	9	4	7	20 (11)	
Increase somewhat	35	37	65	137 (75.3)	
Increase greatly	3	5	17	25 (13.7)	
...working continuously with patient safety?					
Decrease greatly	0	0	0	0	90%
Decrease somewhat	0	0	0	0	
No difference	3	7	9	19 (10.3)	
Increase somewhat	38	29	60	127 (69.0)	
Increase greatly	6	12	20	38 (20.7)	
...health care staff's own initiatives to identify patient safety risks in daily work?					
Decrease greatly	0	0	0	0	74%
Decrease somewhat	0	0	0	0	
No difference	12	7	29	48 (25.7)	
Increase somewhat	31	32	49	112 (59.9)	
Increase greatly	4	9	14	27 (14.4)	
How do you think repeated Walk Rounds in your unit will impact your...					
...understanding of patient safety risks?					
Decrease greatly	0	0	0	0	

Decrease somewhat	0	0	0	0	
No difference	5	8	20	33 (17.8)	
Increase somewhat	23	33	53	109 (58.9)	82%
Increase greatly	16	7	20	43 (23.2)	
...attention to identifying patient safety risks?					
Decrease greatly	0	0	0	0	
Decrease somewhat	0	0	0	0	
No difference	6	11	19	36 (19.6)	
Increase somewhat	26	27	54	107 (58.2)	80%
Increase greatly	11	10	20	41 (22.3)	
...motivation to address patient safety risks?					
Decrease greatly	0	0	0	0	
Decrease somewhat	0	0	0	0	
No difference	14	17	20	51 (28.2)	
Increase somewhat	20	17	46	83 (45.9)	72%
Increase greatly	9	14	24	47 (26.0)	
...stress due to having to deal with one more task?					
Decrease greatly	0	0	0	0	
Decrease somewhat	0	2	2	4 (2.3)	
No difference	27	35	58	120 (69.4)	
Increase somewhat	13	8	25	46 (26.6)	28%
Increase greatly	1	0	2	3 (1.7)	
...concerns about patient safety problems?					
Decrease greatly	0	1	0	1 (0.6)	
Decrease somewhat	2	9	5	16 (9.1)	
No difference	29	30	55	114 (64.8)	
Increase somewhat	11	5	25	41 (23.3)	26%
Increase greatly	1	0	3	4 (2.3)	

* Internal data loss not included.

APPENDIX 4

Study 1. Bivariate and Multivariate Logistic Regression Models with High Overall Patient Safety as Response Variable

Explanatory Variables	Bivariate Model			Multivariate Model		
	OR	95% CI	p Value	OR	95% CI	p Value
Communication openness	1.06	1.06-1.06	<0.001	1.01	1.00-1.01	<0.001
Feedback and communication about errors	1.06	1.06-1.06	<0.001	1.01	1.01-1.02	<0.001
Handoffs and transitions	1.06	1.05-1.06	<0.001	1.01	1.01-1.01	<0.001
Management support for patient safety	1.05	1.05-1.05	<0.001	1.01	1.01-1.01	<0.001
Non-punitive response to errors	1.04	1.04-1.04	<0.001	0.99	0.99-1.00	<0.001
Organizational learning	1.07	1.07-1.07	<0.001	1.01	1.01-1.02	<0.001
Overall perception of patient safety	1.11	1.11-1.11	<0.001	1.08	1.07-1.08	<0.001
Staffing	1.06	1.05-1.06	<0.001	1.02	1.01-1.02	<0.001
Supervisor/manager expectations and actions promoting safety	1.06	1.05-1.06	<0.001	1.01	1.00-1.01	<0.001
Teamwork across units	1.06	1.06-1.06	<0.001	1.00	1.00-1.01	0.053
Teamwork within units	1.06	1.06-1.07	<0.001	1.01	1.01-1.02	<0.001
Frequency of events reported	1.04	1.03-1.04	<0.001	1.01	1.01-1.01	<0.001
Sex						
Male (reference)	–	–	–	–	–	–
Female	0.99	0.93-1.05	0.670	0.94	0.85-1.04	0.203
Age						
18-34 years (reference)	–	–	–	–	–	–
35-54 years	1.54	1.44-1.64	<0.001	0.81	0.72-0.92	<0.001
>54 years	2.00	1.85-2.16	<0.001	0.71	0.61-0.83	<0.001
Professional experience						
< 5 years (reference)	–	–	–	–	–	–
6-15 years	1.18	1.09-1.29	<0.001	1.07	0.93-1.22	0.339
>15 years	1.97	1.82-2.13	<0.001	1.23	1.05-1.44	0.009
Working time						
<20 hours per week (reference)	–	–	–	–	–	–
20-39 hours per week	1.11	0.90-1.36	0.343	1.21	0.89-1.63	0.221
40-59 hours per week	1.12	0.91-1.38	0.298	1.13	0.83-1.53	0.425
>60 hours per week	0.96	0.73-1.25	0.743	1.46	0.96-2.20	0.074
Work area						
General wards (reference)	–	–	–	–	–	–
Emergency care	1.13	1.06-1.20	<0.001	1.36	1.24-1.49	<0.001
Psychiatry care	1.00	0.93-1.08	0.958	0.80	0.72-0.90	<0.001
Staff position						
Managers	–	–	–	–	–	–
Registered nurses	0.30	0.27-0.33	<0.001	0.98	0.84-1.14	0.759
Enrolled nurses	0.39	0.35-0.43	<0.001	1.32	1.12-1.56	0.001
Physicians	0.31	0.27-0.34	<0.001	1.24	1.05-1.46	0.010

Abbreviations: OR, odds ratio; CI, confidence interval.

Model statistics for the multivariate model: LR $\chi^2(25) = 15,094.0$, $p < 0.001$, McFadden $R^2 = 0.461$. Hosmer-Lemeshow goodness of fit $\chi^2(8) = 7.71$, $p = 0.788$.

Papers

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