Synergies for Safety

A theoretical-empirical study into different safety management approaches for hospital care

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A theoretical-empirical study into different safety management approaches for hospital care

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Een theoretisch-empirisch onderzoek naar verschillende managementbenaderingen voor veiligheid in ziekenhuizen

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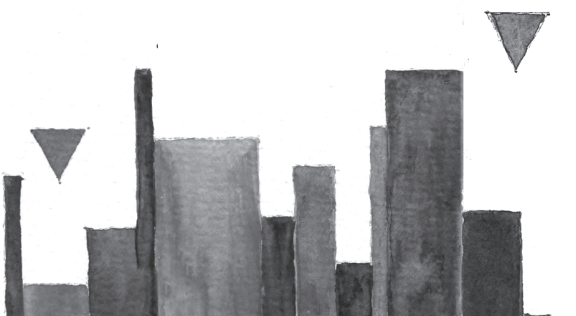
Chapter 1

General introduction



A patient, let's call him Mr Jansen, is admitted to the emergency department (ED) on clinical suspicion of stroke. To confirm the diagnosis and to distinguish between a cerebrovascular infarction and a haemorrhage, neurologist Marieke immediately requests a CT scan. Mr Jansen is brought to the CT by ED nurse Janine, who takes a quick look at the CT images before she returns to the ED. On the images, Janine sees a cerebral bleeding. After she had taken care of her next patient, Janine calls the stroke unit to inform how Mr Jansen is doing. Her colleague tells her that Marieke just started the thrombolytic therapy. Janine is puzzled by this; in the case of an infarction immediate thrombolysis is of vital importance, but in the case of a haemorrhage the therapy could worsen the bleeding rather than control it, and she had seen a bleeding on Mr Jansen's CT images. Janine does, however, not share her concerns. After all, Marieke is a highly experienced and knowledgeable physician who always takes good care of her patients. 'She will know best', Janine thinks.

In her endeavour to deliver the best possible care to her patient, Marieke wanted to start a treatment as soon as possible – after all, 'time is brain' – and, therefore, she checked the CT scan herself rather than waiting for the results of the radiologist. The scan she saw revealed no bleeding, thus Marieke started thrombolytic therapy. However, at the time Marieke checked the CT images, the scan that was made during the admission was not yet uploaded in the patient's record; instead she checked a previously made cerebral scan. As a result, Marieke erroneously excluded haemorrhage as a diagnosis and she prescribed thrombolysis; a treatment which most likely worsened the bleeding rather than being beneficial for Mr Jansen's health. In the end, Mr Jansen died.

(Case description based on an interview with a member of the board of directors of one of the hospitals that participated in this study; all names are fictitious)

Healthcare professionals, like doctor Marieke and nurse Janine, bear a great responsibility for delivering high-quality, safe care to all of their patients. However, as illustrated by the case of Mr Jansen, safety incidents may easily occur. Since healthcare professionals work at the centre of care delivery, they are often directly involved in safety incidents, but they are also in the position to early detect errors and to take preventive actions in order to avoid iatrogenic injuries. However, care providers are not the only ones who have an important role in ensuring patient safety, so do healthcare managers. Managers may, for example, contribute to patient safety by creating a climate in which patient safety is highly valued and employees feel safe to express themselves, by encouraging or enforcing appropriate safety behaviours, and by providing the necessary resources to deliver safe care. When confronted with safety incidents like the one that happened to

Mr Jansen, managers could increase managerial control by checking the (stroke-related) protocols and procedures, tightening them if necessary and more strictly enforcing compliance. In contrast, managers could also focus on increasing awareness of safety risks and professionals' responsibilities (e.g., in terms of speaking up) by organising a debriefing and discussing the incident within the healthcare team. Despite growing recognition that managers have a leading role in ensuring safe care delivery, *"little is known about what healthcare managers are doing in practice to ensure and improve quality of care and patient safety"* (Parand, Dopson, Renz, & Vincent, 2014, p. 1); especially when it comes to middle and frontline managers. The current study aims to gain insight into the management approaches that managers use while managing patient safety and to explore the effect of different safety management approaches on the attitudes and behaviour of healthcare professionals as well as patient safety performance.

In 1863, Florence Nightingale stated already that *"the very first requirement in a Hospital [is] that it should do the sick no harm"* (Nightingale, 1863). As a nurse, she observed that the care, that was supposed to cure patients, involved various safety risks that could cause harm or even lead to patients' deaths. In other words, patient safety – defined as the *"freedom from accidental or preventable injuries produced by medical care"* (AHRQ, no date) – was not guaranteed and a hospital treatment could be more hazardous than beneficial for patients. Even though hospital care has significantly improved over the past 150 years, it is still not self-evident that patients are safeguarded from (preventable) adverse events that cause temporary or permanent harm to them. Over the last decades, various studies have shown that incidence rates of adverse events range from 3.3% to 12.3% of hospitalised patients of which 30% to 70% are judged preventable (Aranaz-Andres et al., 2008; Baker et al., 2004; Brennan et al., 1991; Kohn, Corrigan, & Donaldson, 2000; Rafter et al., 2017; Sommella et al., 2014; Soop, Fryksmark, Köster, & Haglund, 2009; Sousa, Uva, Serranheira, Nunes, & Leite, 2014; Vincent, Neale, & Woloshynowych, 2001; Zegers et al., 2009). The occurrence of adverse events is frequently associated with additional treatments or prolonged hospital stay, and studies demonstrated that almost 5% of adverse events result in permanent disability and around 10% contribute to the patient's death. In the Netherlands, up to 5.7% of all of the patients admitted to a hospital suffer from an adverse events, such as an hospital-acquired infection or medication-related event (Baines, Langelaan, de Bruijne, Spreeuwenberg, & Wagner, 2015), leading to around 1,000 preventable deaths annually (Langelaan et al., 2013; Langelaan et al., 2017). Direct medical costs of these adverse events are estimated to be 523 million euros per year. In recent years, public awareness of safety risks in care delivery created a sense of urgency and focused hospitals' attention and action towards minimising patient harm. Experts in the field of patient safety generally agree that, as a result of these efforts, healthcare is safer now than it was 15 years ago, when the Institute of Medicine published its landmark report *'To err is human'* (Kohn et al., 2000; National Patient Safety Foundation, 2015), but

longitudinal studies show that incidence rates of adverse events remain fairly consistent (e.g., Baines et al., 2015; Landrigan et al., 2010). As a result, healthcare organisations face great pressure to improve patient safety.

Notwithstanding the widely agreed necessity to improve safety in care delivery, no clear consensus exists on how to effectively manage patient safety. In the literature, a wide array of leadership behaviours and management practices has been described with regard to patient safety management (e.g., Parand et al., 2014; Verschueren, Kips, & Euwema, 2013). Managers show, for example, role modelling behaviour (e.g., Leroy et al., 2012), implement evidence-based safety protocols and checklists (e.g., Pronovost et al., 2006; de Vries et al., 2010), organise team trainings (e.g., Weaver, Dy, & Rosen, 2014), participate in safety walk rounds (e.g., Frankel et al., 2008) and provide employees with performance feedback to make them aware of the safety risks that care delivery entails (e.g., Giesbers, Schouteten, Poutsma, van der Heijden, & van Achterberg, 2015). Some of these interventions demonstrated reductions in adverse events or preventable mortality, but evidence on their effectiveness is often inconclusive (Shekelle et al., 2013). Moreover, safety interventions are never implemented in isolation and their chances of success seem to depend largely on the implementation process and their embedding within the organisation (Singer & Vogus, 2013). Prior research did also focus on hospital managers' leadership style in relation to patient safety management. Particular interest was shown in transformational leadership (Verschueren et al., 2013), characterised by leaders who show commitment, inspire followers and engage their employees in patient safety (Northouse, 2013). It is, however, questionable whether such charismatic and inspirational leadership styles best characterise the role of hospital managers in patient safety management, especially at an operational level. Moreover these leadership styles exclusively focus on the traits and behaviour of the leader, overlooking the broader spectrum of management practices used to ensure safe care delivery. Therefore, it may be relevant to shift the focus to the combination of leader behaviours and management practices that are used to optimise patient safety; also referred to as a safety management approach.

A management approach differs from a leadership style in that it encompasses both the personality and behaviour of the leader as well as the broader spectrum of management practices and devices used to ensure that employees show appropriate safety behaviours. Human resource management (HRM) broadly distinguishes two management approaches that guide employee behaviour: control- and commitment-based management (Arthur, 1994; Walton, 1985). These management approaches have been described as two extremes in a management spectrum, in which the former is a formalised, top-down approach that focuses on regulating, monitoring and controlling employee behaviours; whereas commitment-based management is characterised by creating awareness and facilitating an internalisation of the organisation's mission, vision and goals to ensure that employees demonstrate appropriate behaviour (Boselie, 2002; Walton, 1985). Both man-

agement approaches may be applicable to and relevant for patient safety management (Khatri, Baveja, Boren, & Mammo, 2006); although good insight into the management approaches and clear consensus on the use of both approaches to minimise patient harm is lacking. This lack of consensus is, for example, illustrated by recommendations on how to improve poor standards of care and high rates of preventable mortality in the Mid-Staffordshire hospital in the United Kingdom. While Francis (2013) recommended numerous types of new regulations and highlighted, among other things, the importance of compliance with standard procedures and taking action when expectations are not met. Berwick and colleagues placed greater emphasis on prioritising patient safety within the organisation, embracing transparency, engaging and empowering healthcare professionals, and creating a learning environment (National Advisory Group on the Safety of Patients in England, 2013). So, elements of both extremes of the management spectrum were suggested as a means to improve patient safety in this specific case, raising questions about the use and effectiveness of both management approaches with regard to patient safety management.

RESEARCH QUESTIONS

This dissertation aims to provide insight into how hospital managers manage patient safety, why they choose a specific safety management approach and how different management approaches affect healthcare professionals' safety-related attitudes and behaviour as well as patient safety performance. Therefore, the main research question is:

How do hospital managers manage patient safety, and what are the effects of different safety management approaches on healthcare professionals' safety attitudes, behaviour and patient safety performance?

The main research question is subdivided in five sub-questions, the first of which addresses the conceptualisation of different safety management approaches in hospital care.

1. **How can safety management approaches in hospital care be conceptualised, using the concepts of control- and commitment-based management?**

Walton (1985) originally developed the concepts of control- and commitment-based management to describe two different approaches to workforce management in a factory. The former (implicitly or explicitly) assumes that employees are incapable of self-regulation and, therefore, their behaviour constantly needs to be regulated and controlled. The latter emphasises the creation of an environment in which employees

gain commitment to organisational objectives, which gives them cues about appropriate behaviours and stimulates them to take initiative (Khatri et al., 2006; Walton, 1985). At first sight, a commitment-based management approach seems better suited while dealing with complex safety issues in a context of highly-skilled and autonomous working professionals (Khatri et al., 2006). Standardisation of work processes and managerial control have, however, proven to be effective as well (e.g., de Vries et al., 2010) and are considered important factors in ensuring safety in high-reliability organisations (e.g. aviation) which are – despite criticism against the parallel – often seen as an example for managing safety in healthcare (Katz-Navon, Naveh, & Stern, 2007; Rogers & Gaba, 2011). So, both management approaches might be relevant for managing patient safety. However, to be able to apply the concepts of control- and commitment-based management in this study, they first need to be adapted specifically to the realm of patient safety management in hospitals; after all, every situation and task to be accomplished requires specific leadership behaviours and management practices. Moreover, the current conceptualisations of the management approaches (Arthur, 1994; Khatri et al., 2006; Walton, 1985) are rather abstract and do not give detailed insight into the concrete actions that managers take to ensure desired behaviours of their employees. Therefore, the concepts of control- and commitment-based management first need to be reconceptualised to gain insight into what it exactly is that hospital managers do to manage patient safety.

Secondly, we were interested in why hospitals choose a specific safety management approach. Therefore, the second sub-question is:

2. How do internal organisational characteristics and external environmental conditions influence the shaping of safety management approaches in hospital care?

Awareness of adverse events in hospitals placed patient safety in the centre of attention of healthcare professionals, managers, governmental organisations, health insurance companies and patient associations. External stakeholders increasingly put pressure on hospitals to improve patient safety. On the one hand by providing directions for safety behaviours as well as improvements, on the other hand by enforcing transparency on safety performances. In 2008, the Dutch national safety programme 'Prevent Harm, Work Safely' introduced, for example, concrete interventions targeted at high-risk safety themes, initiated improvement in safety leadership and risk assessments, and guided the implementation of a safety management system in Dutch hospitals (Baines et al., 2015). Furthermore, medical professional associations do increasingly provide directions for safe care delivery by establishing evidence-based protocols and guidelines (Noordegraaf & Steijn, 2013). Moreover, hospitals are required to report safety performance indicators to governmental organisations as well as health insurers (Van de Bovenkamp, de Mul, Quartz, Weggelaar-Jansen, & Bal, 2014) and to participate in accreditation systems in order to ensure high-quality and safe care delivery. While shaping their safety management

approaches, hospitals will have to balance these external demands from institutional and competitive stakeholders with the internal needs and possibilities of the organisation. Hospitals employ, for example, a highly professionalised and autonomous working workforce which is originally characterised by self-regulation inside the professional domain and which generally mounts considerable resistance to managerial interference (Freidson, 2001). This raises the question how hospitals deal with the wide variety of possibly conflicting safety demands while shaping their safety management approach, and how they balance the external demands with their internal needs and organisational characteristics.

3. How can safety management approaches in hospital care be measured?

Gaining insight into the effect of different safety management approaches first requires the ability to measure a management approach. Various assessment tools already exist for managerial actions and leader behaviours in relation to patient safety management, but none of them directly corresponds with the conceptualisation of the management approaches used in this study. Khatri and colleagues (2007) previously investigated the concepts of control- and commitment-based safety management, but their measurement scale remains rather abstract and does not focus on concrete management practices and leader behaviours. Avolio & Bass's (2004) conceptualisations of transactional and transformational leadership resemble our management approaches, but it is questionable whether these charismatic and inspirational leadership styles best characterise the role of hospital managers in patient safety management, especially at the operational level. Furthermore, according to some scholars *"there is a pressing need for much stronger conceptualizations of leadership that clearly define leadership practices"* (Wong, Cummings, & Ducharme, 2013, p. 719). Safety management is also incorporated as a theme in frequently cited safety culture assessment tools (Halligan & Zecevic, 2011). These tools do, for example, include items on safety commitment of senior management, managerial support for patient safety, communication openness, leaders' awareness of safety problems and their reactions to reported safety concerns (e.g., Blegen, Gearhart, O'Brien, Sehgal, & Alldredge, 2009; Ginsburg et al., 2009; Sexton et al., 2006; Singer et al., 2007). Hence, attention is predominantly given to managerial practices and leader behaviours in line with a commitment-based management approach. This is also the case for other measurement scales which focus on specific safety leadership behaviours, such as behavioural integrity (Leroy et al., 2012). Far less attention has been devoted to objectifying hospital managers' role in regulating, monitoring and controlling employee behaviour. Therefore, we aim to develop a measurement instrument which highlights both control- and commitment-based safety management.

4. What is the effect of different safety management approaches on healthcare professionals' safety attitudes and behaviour?

In HRM literature it is increasingly recognised that leader behaviour and management practices do not directly influence organisational performance but that *"improved performance is [instead] achieved through the people in the organization"* (Guest, 1997, p. 269). The same applies to patient safety management. Therefore, *"in order to clearly understand the relationship between [management practices] and performance, one must attempt to understand how practices impact individuals, who may then collectively impact performance"* (Paauwe, Wright, & Guest, 2013, p. 11). A safety management approach can be considered an organisational communication device that sends a certain message to employees (Bowen & Ostroff, 2004). It may, for example, signal whether delivering safe care is considered important within the organisation (i.e., climate for safety) or whether the organisation is safe to take interpersonal risks like asking for help or speaking up about patient safety concerns (i.e., psychological safety) (Edmondson, 1999; Zohar, Livne, Tenne-Gazit, Admi, & Donchin, 2007). Employees' interpretation of the message communicated by managers may also guide their behaviour. A wide range of behavioural processes is considered relevant for delivery safe care, including compliance which safety protocols or checklists (e.g., de Vries et al., 2010), (interdisciplinary) teamwork and effective communication (Flin, O'Connor, & Crichton, 2008). In our research we will specifically focus on employee voice. By discretionary raising concerns, asking questions and coming up with suggestions, healthcare professionals can prevent the occurrence of adverse events and contribute to improving patient safety (Okuyama, Wagner, & Bijnen, 2014). This is, for example, illustrated by the case described at the start of this chapter: when nurse Janine would have expressed her concerns about the treatment given to Mr Jansen, she might have prevented the fatal adverse event. Whether healthcare professionals engage in voice behaviour is, among other things, influenced by the behaviour of their direct supervisor (Ashford, Sutcliffe, Christianson, 2009). Deeper understanding of the effect of different leadership behaviours and management practices is, however, needed to be able to shape effective management approaches to optimise healthcare professionals' safety-related attitudes and voice behaviour.

5. What is the effect of different safety management approaches on patient safety performance?

All efforts put into safety management are aimed at ensuring patient safety and reducing the incidence of iatrogenic injuries or preventable mortality. Using preventable harm as a measure of the effectiveness of safety management is, however, challenging because safety incidents are rare and it can be difficult to separate harm due to safety incidents from harm due to illness or being inherent to a patient's treatment (Vincent, 2010). Alternative patient safety assessment tools are, among other things, found in structural measures or

process indicators (Vincent, 2010), self-reported safety incidents (e.g., Leroy et al., 2012), and patient- or staff-reported perceptions of the level of patient safety (e.g., Lawton et al., 2015). The latter is considered a useful indicator for patient safety performance as staff perceptions are found to align with more objective safety measures such as the proportion of patients who received harm-free care (Lawton et al., 2015; Smeds-Alenius, Tishelman, Lindqvist, Runesdotter, & McHugh, 2016; Stalpers, Kieft, van der Linden, Kaljouw, & Schuurmans, 2016). In contrast, studies demonstrated that incident reporting provides a gross underestimate of the true incidence of adverse events and near misses (e.g., Vincent, 2010; Westbrook et al., 2015). Therefore, we will operationalise patient safety performance as staff perceptions of the level of patient safety in a department.

RESEARCH DESIGN

To answer the research questions, both qualitative and quantitative research methods were used. First, a qualitative study was conducted to gain insight into *how* hospitals manage patient safety and *why* they choose a specific safety management approach. From September 2013 to April 2014, five Dutch hospitals participated in the qualitative phase of our research. Within each hospital, semi-structured interviews were conducted with respondents who occupy a central role in safety management and who work at different hierarchical levels within the organisation. We conducted a total of 45 interviews with 50 respondents (some interviews were duo-interviews), including (chief) patient safety officers, members of the board of directors, members of the medical advisory board, medical managers, business unit managers and nurse managers. The variety of positions held by the respondents included in this study provided us with the opportunity to obtain a broad overview of the safety management approaches used within the hospitals. Results of the qualitative research are presented in chapters 2 and 3 of this dissertation.

The second part of this dissertation is based on a cross-sectional survey study conducted among healthcare professionals and direct supervisors working in clinical hospital departments. The quantitative phase of our research focused on how different safety management approaches affect healthcare professionals' safety-related attitudes, behaviours and patient safety performances. Via hospital associations, all of the Dutch hospitals were invited to participate, resulting in a sample of 7 general hospitals, 8 top-clinical teaching hospitals and 2 university medical centres (respectively 15%, 29% and 25% of all of the hospitals in the Netherlands) (Dutch Hospitals Association, 2015). From September 2014 to May 2015, all of the 11,809 nurses working in the clinical departments of these hospitals as well as their 712 direct supervisors (i.e., nurse managers) were invited to complete a questionnaire. We specifically focused on nurses because of their central role in care delivery and ensuring patient safety (Institute of Medicine, 2004), since they

form the largest occupational group employed in hospitals and because they have a clear 'chain of command' with a nurse manager as their direct supervisor. The nurses answered questions about the perceived safety management approaches, their attitudes towards a climate for safety and psychological safety, safety-related behaviours and the perceived level of patient safety within the department. Data gathered from nurse managers consisted of their perceptions of the safety management approaches they put into practice and ratings of their nurses' safety-related behaviours. The survey data that we collected were used for multiple purposes. First, part of the data was used to develop and test a measurement instrument for control- and commitment-based safety management. Subsequently, we used the dataset to explore the relationships between both safety management approaches and nurses' safety-related attitudes, behaviours and patient safety performances. Because of the complexity of these relationships two conceptual models were developed which were analysed separately. Results of the quantitative research are presented in chapters 4, 5 and 6 of this dissertation.

OUTLINE OF THE DISSERTATION

Chapter 2 presents a reconceptualisation of the concepts of control- and commitment-based management that specifically fits patient safety management in hospital care. Based on findings from the semi-structured interviews, we adapted and refined the concepts as described in HRM literature (Arthur, 1994; Walton, 1985). Furthermore, differences in safety management approaches between and within hospitals are discussed, as well as some first insights into the reasons that underlie the variation.

In ***chapter 3***, we focus in more detail on why hospitals choose a specific safety management approach. Using a heuristic framework based on the contextually-based HR theory (Paauwe, 2004), we analysed how institutional, competitive and configurational factors as well as internal issues of strategic choice affect the safety management approach that is used by hospital managers.

Building on the conceptualisation that is presented in chapter 2, ***chapter 4*** describes the development of a measurement instrument for control- and commitment-based safety management. A set of survey items was formulated which address nurses' perceptions of the leadership behaviours and management practices that their direct supervisors put into practice. Psychometric properties of the new measurement instrument were tested in a sample of nurses working in clinical hospital departments.

Chapters 5 and 6 do, subsequently, aim to gain insight into the influence of control- and commitment-based safety management on healthcare professionals' safety-related attitudes, behaviour and patient safety performances. In ***chapter 5***, we explore the relationship between both management approaches and nurses' willingness to engage in

problem-focused voice – defined as raising *"concerns […] for the benefit of patient safety and care quality upon recognising or becoming aware of the risky or deficient actions of others within healthcare teams"* (Okuyama et al., 2014, p. 1). Furthermore, we investigated whether the relationship between control- and commitment-based safety management and problem-focused voice is mediated by nurses' perceptions of the climate for safety and team psychological safety within their department.

Chapter 6 focuses on the combined influence of control- or commitment-based safety management and climate for safety on nurses' suggestion-focused voice and their perceptions of the level of patient safety within the department. Constructive suggestions of nurses may contribute to improving patient safety performances. We were interested in whether the perceived safety management approach is associated with nurses' expression of suggestion-focused voice and whether this relationship varies for different levels of climate for safety.

Finally, *chapter 7* provides a summary of and reflection on the main findings from the studies reported in this dissertation. Furthermore, methodological issues are discussed as well as suggestions for future research and recommendations for practice.

Table 1 Overview of dissertation chapters, research design and research sub-questions

Chapter	Title	Research design	Sub-questions
2	Commitment or control: Patient safety management in Dutch hospitals	Semi-structured interviews	1, 2
3	The influence of environmental conditions on safety management in hospitals: A qualitative study	Semi-structured interviews	2
4	The ConCom Safety Management Scale: Developing and testing a measurement instrument for control- and commitment-based safety management approaches in hospitals	Quantitative survey	3
5	Speaking up about patient safety concerns: The influence of safety management approaches and climate on nurses' willingness to speak up	Quantitative survey	4
6	Nurse managers' role in stimulating suggestion-focused voice: A moderated-mediation model of safety management, climate and patient safety	Quantitative survey	4, 5

Chapter 2

Commitment or control: Patient safety management in Dutch hospitals

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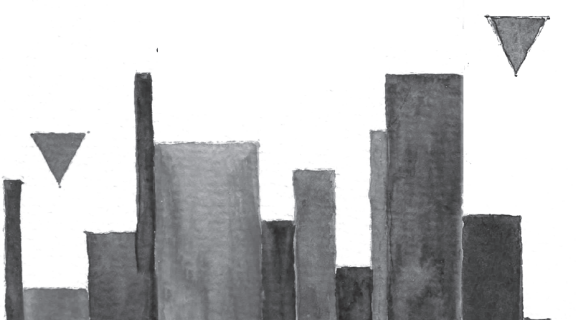
Alingh, C. W., van Wijngaarden, J. D. H., Paauwe, J., & Huijsman, R. (2015). Commitment or Control: Patient Safety Management in Dutch Hospitals. In R. Valle-Cabrera & A. López-Cabrales (Eds.), New Clues for Analysing the HRM Black Box (pp. 97-124). Newcastle upon Tyne, United Kingdom: Cambridge Scholars.



ABSTRACT

Little is known about how to effectively manage healthcare professionals to optimise patient safety. Human resource management (HRM) broadly distinguishes two management approaches that guide employee behaviours: control- and commitment-based management. This qualitative multiple case study aims to explore whether these management approaches are relevant for patient safety management in Dutch hospitals. Whereas the HRM literature describes that organisations focus either on control- or commitment-based management, our results demonstrate that hospitals use a combination of both management approaches. Some hospitals focus more on control-based management, whereas other hospitals emphasise elements of commitment-based management. Once hospitals emphasise commitment-based management, they do not completely abandon control; however, the balance shifts from managerial towards professional control. In addition, the results identified that the combination of management approaches varies within hospitals (e.g., depending on differences in the departments, management positions or job categories), as well as over time (e.g., depending on crisis situations and circumstances that distract hospital's attention from patient safety).

INTRODUCTION

The relationship between human resource management (HRM) and organisational performance has been a key topic in HRM research in the previous decade. Effective employee management via the implementation of appropriate HRM practices or bundles has been positively related to organisational performance regarding productivity, product or service quality, customer satisfaction and financial performance (e.g., Boselie, Dietz, & Boon, 2005; Combs, Liu, Hall, & Ketchen, 2006; Guest, 2011; Jiang, Lepak, Hu, & Bear, 2012; Paauwe, Wright, & Guest, 2013). In healthcare, quality is a key performance indicator, and one of the most important dimensions is (patient) safety (Institute of Medicine, 2001). The delivery of safe care requires the efforts of all employees because healthcare is a multidisciplinary endeavour, highly labour-intensive and its success is dependent on a well-motivated and appropriately skilled workforce (Buchan, 2004; Townsend & Wilkinson, 2010). However, little is known regarding how to effectively manage medical professionals to optimise safety.

Healthcare is considered to be a high-risk industry because both employees and patients face various safety risks. Hence, safety is a top priority within healthcare organisations, which is similar to other high-risk industries, such as military and civil aviation and nuclear power-generation plants (Hudson, 2003). Since the publication of the ground-breaking report *To err is human: building a safer health system* (Kohn, Corrigan, & Donaldson, 2000), several studies have shown that healthcare can be more hazardous than beneficial for patients because of preventable iatrogenic morbidity and mortality (e.g., Baker et al., 2004; Hogan et al., 2012; Vincent, Neale, & Woloshynowych, 2001; Zegers et al., 2009). To illustrate, Langelaan et al. (2013) recently reported that preventable adverse events occur in 1.6% of patients admitted to Dutch hospitals, and up to 1,000 of these patients die each year because of preventable medical errors. The results of the report *To err is human* and subsequent studies have focused the spotlight on safety incidents in healthcare and have triggered health authorities, care organisations and professionals to initiate safety improvement initiatives (Leape & Berwick, 2005).

Despite the extensive efforts, patient safety has been difficult to manage (Leistikow, Kalkman, & de Bruijn, 2011), and progress towards improvements has been slow (Landrigan et al., 2010; Leape et al., 2009). A key challenge of safety management is that executives face difficulties in managing medical professionals, who may experience executive involvement in safety interventions as a threat to their discretion and professional autonomy (Leistikow et al., 2011). Traditionally, medical professionals have worked relatively independent of both the administrative hierarchy and their colleagues (Freidson, 2001). For example, in the Netherlands, most medical specialists are not employed by a hospital, but they form independent partnerships, which have a contractual relationship with a hospital. However, in the previous three decades, healthcare professionals have increas-

ingly been exposed to "*the managerialization of health care*" (Noordegraaf & Van der Meulen, 2008, p. 1055). Driven by factors such as zero risk tolerance, the economisation of healthcare and demands for public accountability, management practices and control mechanisms have been implemented that regulate the work of professionals (Numerato, Salvatore, & Fattore, 2012). A similar trend is evident for patient safety management. Following the example of aviation safety practices, healthcare organisations have widely implemented formalised systems of regulation, monitoring and managerial control. However, it is questionable whether these practices are the most effective strategies for managing safety in healthcare (Katz-Navon, Naveh, & Stern, 2007; Rogers & Gaba, 2011).

To date, research on the effectiveness of safety management has mainly focused on studying the effects of single interventions on safety outcomes. As safety interventions are never implemented in isolation, it may be relevant to shift the focus to the combination of mutually reinforcing safety practices and to examine safety management approaches that are used to optimise patient safety. HR management broadly distinguishes two management approaches that guide employee behaviours: control- and commitment-based management (Arthur, 1992; Arthur, 1994; Walton, 1985). The former is a formalised, top-down approach that focuses on regulating, monitoring and controlling employee behaviours; whereas commitment-based management is characterised by creating awareness and facilitating an internalisation of the organisation's mission, vision and goals to ensure employees demonstrate appropriate behaviour (Boselie, 2002; Walton, 1985). Both management approaches may also be applicable to and relevant for patient safety management (Khatri, Baveja, Boren, & Mammo, 2006); however, to date, no research has been conducted using these concepts. Therefore, the aim of this study is twofold. First, this study aims to explore whether the concepts of control- and commitment-based management are relevant for patient safety management in Dutch hospitals. Second, we aim to explore differences in the safety management approach between and within hospitals, as well as the reasons that underlie the variations.

THEORETICAL FRAMEWORK

In the literature, several classifications of employee management practices, or management control, are distinguished (e.g., Arthur, 1992; Harzing, 1999; Merchant, 1982; Ouchi, 1979; Walton, 1985). Management control mechanisms can be characterised based on the level of hierarchical authority (direct, formal control versus indirect, informal control), the degree of formalisation (formalised control mechanisms that consist of regulations and formal procedures versus cultural mechanisms based on social interaction), and the focus of control (focus on preferred human behaviour versus desired outputs) (Harzing, 1999; Merchant, 1982). These different dimensions are used and integrated in the man-

agement approaches described by Walton (1985) and Arthur (1992; 1994), which included control- and commitment-based management.

Control-based management

A control-based management approach is based on the desire to establish order, exercise control and achieve efficiency (Walton, 1985), as employees are supposed to be incapable of self-regulation (McGregor, 1960). Therefore, this management approach is first characterised by the enforcement of compliance with specified rules and procedures (Eisenhardt, 1985; Walton, 1985). Rules and procedures are attempts to standardise and regulate work processes and to increase predictability. In safety management, this is a commonly adopted approach, which is reflected in the extensive use of protocols, guidelines and checklists to avoid various safety risks (e.g., de Vries et al., 2010; Salzwedel et al., 2013; Thomassen, Storesund, Søfteland, & Brattebø, 2014). Consistent with this approach, control-based management emphasises actively monitoring employee behaviour and providing them with feedback (i.e., rewarding or disciplining employees) depending on the adequacy of following directives (Bass & Avolio, 1994; Boselie 2002). Monitoring employee behaviours may help supervisors to identify errors and safety risks that require attention; by providing feedback on the employees' actions, they may encourage frontline staff to exhibit appropriate (safety) behaviours (Flin & Yule, 2004). Organisations that adopt a control-based management approach are characterised by centralised decision-making, top-down allocation of authority and status symbols explicitly linked to management positions (Boselie, 2002; Walton, 1985). Finally, according to a control-based approach, individuals are held accountable for their own performances and may be rewarded based on specific, quantifiable employee outcomes, which applies the principle of *"a fair day's pay for a fair day's work"* (Arthur, 1994; Walton, 1985, p. 78). This compensation strategy, which strengthens extrinsic motivation in employees, requires management to have relatively complete knowledge of work-processes and a high-ability to effectively set (minimum) performance standards and adequately measure an individual's output to offer employees appropriate performance-related pay (Eisenhardt, 1985; Ouchi, 1979).

Commitment-based management

In contrast, the philosophy of a commitment-based management approach is that fully committed and intrinsically motivated employees will deliver better performances, are capable of self-discipline and are willing to assume responsibility or demonstrate initiative (Khatri et al., 2006; Walton, 1985). First, this management approach is characterised by shaping a work environment where control and coordination depend on shared goals and values (Walton, 1985), which are forged by factors such as socialisation and training programs (Arthur, 1992; Ouchi, 1979). Therefore, a commitment-based management

approach requires leaders who create awareness of organisation's mission, vision and goals and who empower and support their employees (Bass & Avolio, 1994; Boselie, 2002; Khatri et al., 2006). Leader commitment to patient safety underscores the priority given to safety and may affect employee commitment (Flin & Yule, 2004). Employees who have internalised safety norms and who highly value patient safety are supposed to better act accordingly and demonstrate a stronger sense of personal responsibility and shared ownership of patient safety (Hughes, Chang, & Mark, 2009). This is, in turn, associated with a reduction in the potential safety and adverse events (Pronovost et al., 2003; Singer, Lin, Falwell, Gaba, & Baker, 2009). Furthermore, by supporting and empowering employees, leaders may be able to create a learning environment where safety concerns and insights are shared and safety incidents and near-misses are reported (Edmondson, 2004). Consistent with this approach, employees are encouraged to participate or be involved in managerial decision-making and are invited to demonstrate initiative (Arthur, 1994; Walton, 1985). According to this approach, the management hierarchy is relatively flat and every employee is supposed to be a "manager" whose expertise is used to reach organisational goals (Walton, 1985). Finally, a commitment-based management approach does not rely on minimum performance standards, and teams, rather than individuals, are held accountable for their performances; therefore, this approach may encourage employees to improve safety performance beyond expectations (Boselie, 2002; Flin & Yule, 2004; Walton, 1985).

In conclusion, the concepts of control- and commitment-based management represent two distinct management approaches that are used to influence employee behaviours (Arthur, 1994; Walton, 1985). Although some scholars consider elements of control- and commitment-based management to be complementary (e.g., Ouchi, 1979), organisations predominantly rely on one management approach, which is chosen based on the organisational objectives, task characteristics and environmental conditions (Arthur, 1994; Walton, 1985). Thus, organisations primarily focus on either control- or commitment-based management. The question remains whether this is also the case in safety management: do hospitals prefer one management approach or do they combine elements of both approaches?

METHODOLOGY

A qualitative multiple case study design (Yin, 2008) was used to explore safety management approaches in Dutch hospitals (N=5). The selected cases included both general and top-clinical teaching hospitals, which were located across the Netherlands and varied in scores on safety performance based on publicly available ranking lists (i.e., Elsevier rankings). The ranking consists of a combined score of various safety performance indicators.

Because, the ranking lists have been criticised for fluctuation over time (Pons, Lingsma, & Bal, 2009), the scores of three successive years have been combined. Hence, a diverse set of hospitals was included in this study to broadly gain insight into safety management in Dutch hospitals.

Table 1 Case characteristics of the five hospitals

	Hospital A	Hospital B	Hospital C	Hospital D	Hospital E
Type of hospital	Top-clinical	Top-clinical	General	General	Top-clinical
Hospital size (no. of beds)	<500	750-1000	500-750	500-750	>1000
Safety performance†	Low	Low	Low	Mediocre	High

† Safety performance has been reported on a scale that ranges from 1 to 4. Scores < 2 are indicated as low, scores of 2-3 are indicated as mediocre and scores > 3 are indicated as high.

Within each hospital, data collection consisted of a combination of document analyses and semi-structured interviews. Forty-five interviews were conducted with 50 respondents (some interviews were duo-interviews). To obtain a broad overview of safety management, a multi-actor approach was adopted in which the respondents were selected based on their role as key actors in safety management. The respondents included members of the board of directors, medical managers, safety managers, business unit managers and nurse managers. Table 2 provides an overview of the respondents who participated in the study. All interviews were conducted in September 2013 through April 2014 and lasted one hour on average.

Table 2 Number of respondents per function

	Hospital A	Hospital B	Hospital C	Hospital D	Hospital E	**Total**
Safety manager / advisor	1	2	3	1	1	**8**
Board of directors	1	1	1	1	1	**5**
Medical manager / advisory board	2	2	2	4	4	**14**
Business unit manager	2	2	1	0	2	**7**
Nurse manager	4	2	2	3	3	**14**
Project manager	1	0	1	0	0	**2**
Total	**11**	**9**	**10**	**9**	**11**	**50**

The interviews aimed to explore the management approach that hospitals adopted to manage patient safety. The interview topics were derived from the theory of control- and commitment-based management (e.g., Arthur, 1992; Boselie, 2002; Walton, 1985). Furthermore, document analyses (including strategic policy plans, project plans and

reports of safety management projects) were conducted for a first impression of safety management in the participating hospitals and to identify additional topics to discuss during the interviews. The interviews focused on the organisation's safety strategy, risk management, respondents' role in safety management and safety interventions that are applied in the hospital or the department (e.g., formalisation, socialisation, leadership). The respondents were also asked to elaborate on why the hospitals adopted certain safety interventions or management practices.

All interviews were audio-recorded and transcribed verbatim. The data obtained from the interviews and documents were subsequently analysed using qualitative data analysis software Atlas.ti to conduct a thematic analysis (Braun & Clarke, 2006). First, the researchers familiarised themselves with the data by (re)reading transcripts and documents and identifying *"patterns of meaning and issues of potential interest in the data"* (Braun & Clarke, 2006, p. 86). Second, initial codes were generated to identify topics of interest. To identify codes, inductive- and deductive-coding were combined. The initial list of codes consisted of key-elements of the theoretical concepts control- and commitment-based management. This list included codes such as 'formalisation', 'monitoring' and 'commitment of managers'. However, the researchers remained open for codes that emerged from the data and searched for specifications of the initial codes. The initial code 'monitoring', for example, covered elements such as 'checking registrations in patient records', 'audits', and 'direct observations by supervisors', as well as 'monitoring by professionals'. Furthermore, new codes emerged from the data, such as 'role modelling behaviour'. In the end, all codes were combined into broader categories or (sub)themes, which were based on similarities in the data, as well as the theory. The final themes provided the basis for the results presented in this paper.

RESULTS

The results demonstrated that the concepts of control- and commitment-based management are indeed relevant for understanding how safety is managed in Dutch hospitals. All studied hospitals combine elements of these management approaches; however, variations exist in the emphasis placed on different elements. First, the characteristics of control- and commitment-based management will be described. The differences between the hospitals, within the hospitals and over time are subsequently discussed, as well as the factors that affect variation in the adopted management approach.

Control-based safety management

In all studied hospitals, patient safety is highly regulated. The information necessary to safely complete care processes is contained in a wide range of detailed (clinical) guide-

lines, protocols and checklists. This is illustrated by the following example: *"[We are] a formalised department. Actually, everything is captured [on paper]. If you look at surgical procedures, related medication, when what steps should be taken, who does what, all of it is actually described"* (nurse manager, hospital A). These rules and procedures, of which the majority have been established by medical professional organisations, were initially formulated as recommendations for delivering high-quality care, and healthcare professionals were allowed to breach the rules if they considered it to be beneficial for a patient's care. Consistent with this approach, several safety checklists were developed to serve as mnemonics of the steps that should be taken during care delivery.

Safety protocols, guidelines and checklists have increasingly been adopted by external regulatory bodies and hospital management as a tool for managerial control. Safety regulations structure work processes and increase predictability, which thereby enables managers and regulatory bodies to check whether healthcare professionals follow the steps that are described. Within hospitals, both supervisors and healthcare professionals with specialised knowledge regarding specific safety issues observe employee behaviours during care delivery. Furthermore, compliance is monitored based on registrations in (electronic) patient records, for example, to verify whether all elements of a surgical safety checklist are completed. Additionally, compliance is assessed during (compliance) audits and screenings, where quality advisors, managers or healthcare professionals use checklists to assess whether steps in a specific procedure are followed. To illustrate: "*During a compliance audit we observe how someone carries out [a time-out procedure in the OR], is the surgeon in charge, is it captured in the medical record, is it spoken out loud, is it done while the entire team is present?"* (safety advisor, hospital B).

Based on the monitoring results, employees are provided with feedback on their compliance with safety regulations. The results of compliance audits and registrations in patient records are reported in departmental newsletters and discussed during team meetings. Moreover, in some departments, the results are discussed on a daily basis during handovers to create an awareness of the relevance of safety compliance. Healthcare professionals also receive individual feedback if supervisors or co-workers note non-compliance, because employees are held accountable for their own compliance behaviour. In the case of recurrent non-compliance, all hospitals implemented formal sanction policies targeted at specific safety issues, such as professional dress-code policies. Healthcare professionals who repeatedly ignore safety rules and procedures face warnings from their direct supervisors, reprimands from the board of directors and are, ultimately, dismissed or fired, which is illustrated by the following example: *"If you see a doctor wearing both his uniform and a watch, or a nurse wearing rings […] or a physician wearing a long sleeves' coat, that is not allowed, and you are in violation. In that case, in our hospital, you receive a 'yellow card', and two 'yellow cards' means you don't work here anymore."* (safety manager, hospital B). Sanction policies are not only aimed at punishing employees

for non-compliance, but they are also used to convey the importance of patient safety. As one of the respondents said: *"The fact that you can [apply sanctions] shows that you as a hospital consider [patient safety] to be important, that is also a signal you give."* (medical manager, hospital E).

It is worth noting that hospitals frequently provide feedback on non-compliance, but employees rarely receive compliments when they follow safety rules and procedures. However, some hospitals have implemented a pay-for-performance reward system for medical specialists who work in independent partnerships, which offers physicians a positive incentive for safety compliance and participation in safety initiatives.

In addition to the elements of managerial control, managers and supervisors in charge of the implementation of safety regulations attempt to create conditions to ensure that safety norms are met; for example, access to hand alcohol should facilitate hand hygiene compliance. They also trigger compliance by informing employees about the content and value of (new) safety rules and procedures. In this context, medical managers and leading medical specialists play a major role in explaining safety regulations and stimulating compliance of physicians because they are considered credible messengers. "*The combination of a quality officer who is also a physician, and the Healthcare Inspectorate who tightly regulates, corrects and controls, is the perfect formula for quality and safety improvement in hospitals."* (medical manager, hospital B). Apart from the Healthcare Inspectorate, external pressure from health insurance companies and the media is also used to highlight the importance of safety compliance and to legitimise the enforcement of compliance with safety protocols, guidelines and checklists. As a member of the board of directors (hospital C) explained: *"Let's say that I made sure that the Healthcare Inspectorate helped us out a bit. So, at a certain moment, I obviously used the Inspectorate to exert external pressure. [...] Especially, the threat of being placed under supervision, under increased supervision, ensured that people eventually complied".*

In conclusion, in healthcare, control-based safety management is not substantially reflected in the existence of clinical protocols, guidelines and checklists but in the way these safety regulations are increasingly incorporated in managerial control systems.

Commitment-based safety management

Commitment-based management is a more amorphous management approach that focuses on stressing the priority of patient safety and strengthening intrinsic motivation in employees. Respondents describe that healthcare professionals are frequently not aware of the safety risks that care delivery entails because they perceive their own performance to be adequate. Therefore, hospitals attempt to increase consciousness by making employees aware of the potential safety risks and deficiencies in their own performances. This awareness is first created by demonstrating evidence of the potential safety risks and the effectiveness of safety interventions; for example, via the discussion

of research findings. Furthermore, awareness is also created by providing insight into the hospital's own safety performances. Serious safety incidents that occur in a hospital are discussed with the healthcare professionals involved in the incident to stimulate a shared learning process. Furthermore, the results of incident analyses, as well as patient outcome measures that are available for a department, such as the number of pressure ulcers or hospital-acquired infections, are discussed during team meetings. Some hospitals also compare their (safety) outcome measures with similar units in other hospitals to motivate healthcare professionals to improve their safety performance. As a medical manager (hospital E) described: *´We have a sort of ICU benchmark [...] and this showed that for certain groups of patients, we have to do better. That hurts because we thought we were doing well and then [the results] showed that was not the case".*

In addition to providing performance information, hospital management may also motivate healthcare professionals for patient safety by demonstrating that safety is highly valued within the organisation. The priority attached to patient safety is shown, for example, by recurrently bringing the topic to the employees' attention. To this end, patient safety is discussed during introduction programs for new employees, in newsletters, during information markets, in e-learnings and training programs, or during team meetings. Specific safety topics, such as medication errors or hand hygiene, are discussed; however, managers and supervisors also explain in more general terms what patient safety is by providing examples of safety incidents. The explanation of safety-related issues and demonstration of the safest way to complete care processes are also part of the coaching role of nurse managers.

Furthermore, top-management commitment stresses the importance of patient safety. Top-management exhibits commitment by participating in safety walk rounds, where they engage in dialogue with healthcare professionals regarding safety risks and improvement initiatives. Commitment is also demonstrated by role modelling behaviours of both supervisors and leading medical specialists. "*We agreed that doctors do not wear a watch, rings or long sleeves under their coats. [...] Then, I really have to stand out as a kind of figurehead, I really have to comply. Nobody should ever be able to confront me with that. And the other way round, I would confront a doctor who is wearing a watch."* (member of the medical advisory board, hospital A). This role modelling behaviour is considered crucial to ensuring the credibility of the communication concerning patient safety. If role models, who earn respect and have close relationships with employees on hospital wards, practise what the hospital preaches, they may encourage healthcare professionals to imitate desired safety attitudes and behaviours. As a nurse manager (hospital B) described: *"Your team is a reflection of yourself, so if I am very open and honest […] they are invited like it's ok to be vulnerable around here".* In this respect, role modelling behaviour may trigger a socialisation process, which causes a preferred behaviour, such as speaking up regarding safety concerns, to be considered normal practice.

Commitment-based safety management also aims to encourage employees' sense of ownership of patient safety by involving them in safety management. Supervisors actively invite employees to make safety recommendations and apply their medical expertise to safety matters. Thus, they are encouraged to report safety risks or incidents, make suggestions for safety improvement and question the suitability and feasibility of safety initiatives. Furthermore, healthcare professionals who developed specialised knowledge regarding specific safety topics provide their colleagues with real-time feedback on their performances; they coach their co-workers, and they are also involved in training programs to inform their colleagues regarding safety topics. This peer education helps to clearly communicate a message and to overcome resistance because the initiatives are more easily accepted if they are introduced by a medical professional rather than someone from hospital management.

Variation between hospitals

None of the hospitals exclusively focused on control- or commitment-based safety management; they all combined elements of both management approaches, although variations were present.

All hospitals implemented the basics of clinical guidelines, protocols and checklists to manage patient safety. These safety rules and procedures express the confidence placed on evidence-based medicine; however, they also form reflections of the safety regulations that are initiated by medical professional organisations and enforced by regulatory bodies, such as the Healthcare Inspectorate. The hospitals incorporated these rules and procedures in systems of management control. All hospitals applied several monitoring procedures and implemented feedback systems, as well as sanction policies, targeted at specific safety issues to underscore the need to comply with the rules. To date, minimal variation was identified between the hospitals. Accordingly, in all studied hospitals, control-based management forms the basics of safety management.

Our results demonstrate that in hospitals B and C, safety management is largely dominated by the elements of control-based management. For example, this is illustrated by nurse managers who argue that in their hospital, the priority attached to patient safety is reflected *"in everything that is imposed upon us, in the hospital-committees that check things out, in the test samples that we have to fill out, and all things that have to be presented to the boss"* (nurse manager, hospital B). Thus, in this hospital, the priority of patient safety is reflected in the control-based management approach used by the organisation. Both hospitals also make considerable use of external pressure to create a sense of urgency and to reinforce adherence to rules and procedures. Hospitals face external pressure from multiple sources, such as the Healthcare Inspectorate, health insurance companies or the media, which could respectively result in hospital-wide or departmental sanctions, a fall in production and associated financial losses, or a loss of

reputation. These consequences generate (extrinsic) motivation in employees to participate in patient safety or comply with the rules. To illustrate, *"There is pressure from health insurance companies. They do not purchase certain types of care if you do not meet their quality standards. Unfortunately, this external pressure is crucial to motivate people"* (member of the board of directors, hospital C).

On top of a control-based management approach, all studied hospitals incorporated elements of commitment-based safety management. As a respondent explained: *"You have to measure, identify and screen things, and at a certain point you also have to say this is it and that includes control as well. But the other side is just as important and that is strengthening the motivation and professional drive of healthcare professionals"* (member of the board of directors, hospital E). Whereas in hospitals B and C, these commitment-based elements are largely overshadowed by the emphasis placed on control-based management, they are prioritised in hospitals A, D and E. In these hospitals, patient safety is high on the list of top-management's priorities, which is reflected in top-managers' commitment to the topic: *"We try to demonstrate the importance that we, as a board, attach to patient safety at all organisational levels [...] and also to participate ourselves, for example, in safety walk-rounds"* (member of the board of directors, hospital D). In contrast, in hospital B, a member of the board of directors said: *"[Patient safety] is not a topic that we are involved in, which became painfully clear again when the Inspectorate visited us"*. Thus, variation was identified in top-management's involvement in patient safety.

Additionally, hospitals A, D and E placed more emphasis on creating a sense of ownership for patient safety because safety is considered an essential part of care delivery rather than a managerial issue. Therefore, managers and supervisors in these hospitals stress the importance of explaining safety issues to their employees and laying safety responsibilities with healthcare professionals on the shop-floor, without directly imposing sanctions for not meeting safety requirements. Moreover, in these hospitals, the employees are actively involved in the development and implementation of safety rules and initiatives. For example, this is reflected in hospital E where medical specialists led the development of patient outcome measures intended to objectify patient safety and the results of the care that they delivered. These initiatives generate positive energy and contribute to a drive for patient safety, especially when they are led by healthcare professionals. As a nurse manager in hospital D said: *"It is all about the results. If you can reach this because they [the employees] came up with the ideas themselves and just wrote down on a coaster, then this is what we decided on, and I think that is fine"*.

Once hospitals adopted elements of commitment-based safety management, this did not imply that they completely abandoned control. A foundation of control-based management remains, and managerial control is also partially replaced by professional control. In hospitals A and E, rather than being controlled by managers or supervisors,

the healthcare professionals play a major role in monitoring each other's behaviours, providing co-workers with feedback on (non-) compliance and speaking up in case of unsafe acts. Professional control occurs on an informal basis during the teamwork of healthcare employees; however, a more formalised approach is also incorporated. An example of the latter is shown in hospital A, where nurses monitor the compliance of healthcare professionals at the ICU: *"Every colleague takes care of a specific protocol, for a certain period of time, and audits his or her co-workers' behaviour"* (nurse manager, hospital A). A similar approach was introduced by medical specialists in hospital E: *"A time-out procedure has been introduced which has to be completed before the start of every round; [we check] everyone's hands, whether they took off their rings, watches and whether they all used hand-alcohol"* (member of the medical advisory board, hospital E). In both examples, healthcare professionals played a leading role in introducing the tools; this role appears to be crucial for successfully adopting professional control: *"You would never be able to enforce this, but since [the time-out procedure] was initiated by the medical advisory board, it works" (member of the board of directors, hospital E).*

In conclusion, all studied hospitals combine elements of control- and commitment-based management to manage patient safety. Our results demonstrated that all hospitals implemented a foundation of control-based management; moreover, different elements of commitment-based management were also used. However, if we position hospitals on a continuum of control- and commitment-based management (see Figure 1), considerable differences were identified regarding the emphasis placed on commitment-based management. Some hospitals almost exclusively focus on control-based management, whereas other hospitals mainly concentrate on elements of commitment-based management. In the latter group of hospitals, control-based management still forms the basics of safety management, although a shift is observed from a focus on managerial control towards professional control.

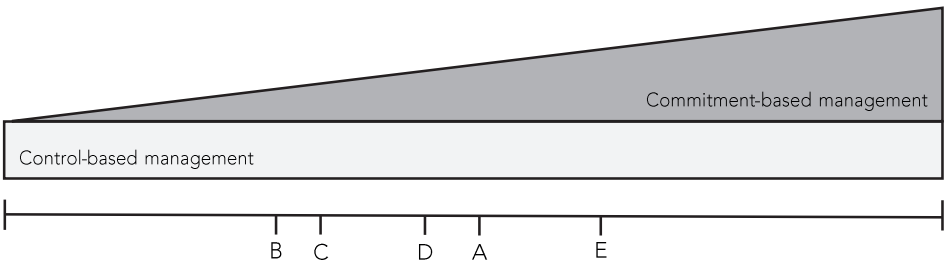


Figure 1 Positioning hospitals on a continuum of control- and commitment-based management

Variation within hospitals

In addition to the variations between the hospitals, our results also indicate differences in the management approach adopted within the hospitals. Within the hospitals, variation was identified based on the respondents' positions in the managerial hierarchy, the differences in hospital departments, and the job categories of the employees.

Managers and supervisors, who hold different positions in the management team of a hospital, perform different contributions to patient safety management. For example, whereas the members of the board of directors have a central role in stressing the importance of patient safety, which demonstrates commitment, and setting limits on acceptable safety behaviour; nurse managers must implement safety policies at the ward level and motivate healthcare professionals to follow safety rules and procedures. Consequently, nurse managers display a very diverse set of management behaviours, including monitoring and feedback on (non-) compliance, as well as continuous safety communication, encouraging participation and coaching leadership. Notably, despite the variation in management approaches at the hospital level, only small differences were identified when the management approaches used by the nurse managers in different hospitals were compared. The differences between the overall management approach and the nurse managers' actions were most striking in hospitals B and C, which have been described as organisations that primarily focus on control-based management. In contrast, the nurse managers still emphasised the use of commitment-based management elements. This may be explained by the fact that most nurse managers have a nursing background. Some nurse managers continue to work part-time as a nurse on their own ward. These nurse managers must find a balance between their roles as a manager and a professional. A control-based approach is in contrast to the way professionals typically interact, which is more based on autonomy and trust. A feeling that many nurse managers have is *"I don't want to be a police officer. If that's my job, then the role of line manager doesn't suit me"* (nurse manager, hospital B). Thus, even if the hospital primarily focuses on control-based management, nurse managers still strongly rely on commitment-based management.

Our results also indicate variation in management approaches based on differences between the departments within a hospital. More specifically, differences were observed between intensive care units (ICUs) and general care units. An ICU is a high-risk environment, and care delivery requires employees to have specialised medical and technical knowledge. Because of this specialised knowledge, employees with expert-knowledge on specific care processes (e.g., ventilation or circulation practitioners) or safety topics are frequently used to create a deeper awareness of safety risks, monitor safety behaviour and coach their co-workers. Moreover, care delivery in an ICU strongly relies on close, multidisciplinary teamwork; which is in contrast to general care units, where nurses treat a larger number of patients and medical specialists are only infrequently on the ward.

Therefore, ICU-supervisors also tend to rely more on professional control because in closer collaborations, the behaviours of colleagues can be monitored more easily. Thus, as a result of the circumstances in an ICU, supervisors tend to rely more on employee professionalism and focus more on the elements of commitment-based management when managing patient safety.

Variation also exists based on job categories: managing medical specialists requires a different safety management approach compared with nurses or other healthcare professionals. Within hospitals, medical specialists are in a unique position because they have considerable professional autonomy, they are hard to control because of their specialist-knowledge, and, moreover, many of them work in independent partnerships rather than being employed in a hospital; thus, there is a lack of a hierarchical working relationship. Consequently, the use of elements of control-based management is problematic because these elements are primarily based on the ability to enforce safety behaviour through hierarchical control. As one of the respondents explained: *"In a normal organisation, you can say rather top-down "watch out guys we agreed on registering pain-scores every shift!". But for the medical staff, that isn't going to work or it is counterproductive. So, there you make greater use of seducing and arguing, and you need other strategies"* (member of the board of directors, hospital D). Hence, the management of medical specialists depends more on elements of commitment-based safety management. First, respondents in all hospitals ascribe a key role to the medical advisory board of the hospital and leading medical specialists because they are considered credible messengers who are able to draw attention to safety matters and explain safety interventions to their colleagues. Role modelling behaviours of leading medical specialists may also convince colleagues to act the same. Consistent with this concept, medical specialists are involved in several safety initiatives and assigned roles as project leaders in safety interventions. Additionally, the demonstration of evidence regarding safety risks or the effectiveness of safety interventions is a powerful tool to manage medical specialists; as one of the respondents said: *"The numbers tell. That's the only thing that triggers real professionals."* (member of the board of directors, hospital B). Therefore, safety outcome measures such as the number of hospital acquired infections are frequently reported to medical specialists, and during safety and necrology meetings safety incidents and risks are discussed. In some hospitals, medical specialists are also actively involved in defining performance outcome measures to avoid discussions on the reliability of outcome measures. For example, this is the case in hospital E, which has been previously discussed. To this end, medical specialists can be managed without affecting their clinical autonomy.

Variation over time

The safety management approach adopted by a hospital or department also varies over time as a result of the change in urgency of safety issues and the priority given to other organisational matters.

In the previous decade, patient safety became a topic of interest in Dutch hospitals because of studies on the incidence and impact of safety incidents, the serious safety incidents that were widely reported in the media, and the introduction of a national patient safety program. Consequently, hospitals focused the spotlight on patient safety, and it became a priority for top-managers. Hospitals increasingly devoted attention to the topic in internal communications, and several awareness campaigns were initiated. However, *"Every medical specialist is convinced that he delivers good quality, and that he provides safe care"* (medical manager, hospital B). The focus on patient safety, brought this idea under pressure, and both hospital management and society demanded to impose stricter managerial control. Following the national safety program, external regulatory bodies imposed a wide range of safety regulations and checks regarding (non-) compliance, which were adopted by the hospitals. Thus, as a result of the national focus on patient safety, both control- and commitment-based management strategies were increasingly used to manage patient safety.

However, over time some hospitals faced circumstances that distracted their attention from patient safety management, such as internal conflicts, poor financial situations or a merger. In hospital C, for example, management was confronted with a poor financial situation, which required budget cuts and restructurings. As a consequence, the credibility of the message that was communicated concerning patient safety suffered. As one of the respondents described: *"You give [employees] conflicting signals if there are, on the one hand, budget cuts and, on the other hand, quality should be improved. That is a difficult message to communicate."* (quality advisor, hospital C). In particular, these difficulties are related to the use of elements of a commitment-based management approach because manager commitment and communication concerning the priority attached to patient safety are key elements of this approach. There may not only be conflicting messages but a (temporary) change in priority also leads to a reduction of time available for patient safety. As a nurse manager (hospital D) illustrated: *"Time is primarily spent on managing financial affairs and issues like that [...] I noticed that I can insufficiently manage quality issues; that is more on an ad hoc basis"*. As a result of the limited amount of time for patient safety, managers and supervisors start to primarily rely on available mechanisms for control-based safety management. Thus, if hospitals face circumstances that distract their attention from patient safety, the focus of their management approach shifts towards control-based management.

Another situation that influences the safety management approach adopted by a hospital is when organisations experience a crisis situation, for example, following a serious

safety incident or an official reprimand of the Healthcare Inspectorate. Taking control of these situations requires hospitals to rapidly respond to ensure patient safety and exhibit decisiveness. Therefore, immediately after such an event, hospitals frequently use a top-down approach, which is characterised by tightening up the safety rules and procedures, closely monitoring employee compliance behaviours, and increasing feedback and sanction policies. To illustrate, the media confronted hospital E with poor hand hygiene compliance of its employees. In response, the hospital took several measures: *"We formulated hygiene policies"*, *"An e-learning in hand hygiene was developed"* and *"[We conducted] audits to check everyone's adherence to dress code policies, for example, at the entrance of the staff restaurant"* (member of the medical advisory board, hospital E). After the crisis has been overcome, the focus credibly shifts towards commitment-based management to internalise the underlying principles, which consolidate the desired safety behaviours in the long-term to form a permanent basis to ensure patient safety. Thus, following a crisis situation, hospitals adopt a dynamic interplay of control- and commitment-based management, which varies based on the stage and handling of the crisis.

DISCUSSION AND CONCLUSION

This study aimed to explore whether the concepts of control- and commitment-based management are relevant for patient safety management in Dutch hospitals. Furthermore, we aimed to explore the differences in the safety management approaches between and within hospitals, as well as the reasons that underlie the variations.

Our results demonstrate that both management approaches are indeed relevant for patient safety management, but that most hospitals combine elements of control- and commitment-based safety management. All hospitals in this study utilise a foundation of control-based management to manage patient safety and, on top of that, use elements of commitment-based management. It appears that hospitals consider control- and commitment-based management to be complementary rather than mutually exclusive. There is, however, considerable variation between hospitals: some hospitals almost exclusively focus on control-based management, whereas other hospitals adopt more elements of a commitment-based approach. Once hospitals focus on commitment-based management, they do not completely abandon control; however, the balance may shift from managerial towards professional control. Apart from the variations between the hospitals, the results also indicate differences in the management approach adopted within the hospitals and over time. The differences within the hospitals are related to differences in the departments, management positions and job categories. Compared with general care units, managers in ICUs focus more on commitment-based management. In these high-risk departments, various mechanisms of professional control are in place, which may

explain why management does not exhibit a strong need to control. Lower-level managers also tend to focus more on commitment- rather than control-based management. The vast majority of the nurse managers have a professional background in nursing, and some nurse managers continue to work part-time as a nurse. Therefore, they must balance their roles as managers and professionals. The way professionals typically interact is not consistent with a control-based approach, which may explain why commitment-based management is favoured. Additionally, variations are also present for different job categories: management of medical specialists is more dependent on a commitment-based approach than management of other healthcare employees. Specialists' non-hierarchical working relationship with the hospital and their clinical autonomy cause difficulties in applying mechanisms of control-based management. Therefore, hospitals focus more on commitment-based elements such as creating awareness of safety risks and role modelling behaviours, which are sources of managing medical specialists without affecting their autonomy. Variation over time is reflected in situations where hospitals face crisis situations or circumstances that distract their attention from patient safety. In crisis situations, hospitals tend to rely more on control-based management to rapidly respond, ensure patient safety and to exhibit decisiveness. Furthermore, circumstances that distract a hospital's attention from patient safety, such as internal conflicts, poor financial situations or a merger, shift its focus also to control-based management. However, in this case, the shift towards control-based management is explained by a reduction in time devoted to patient safety because the other circumstances are given priority.

These findings suggest that relationships between professionals and managers have changed in healthcare. Professionals perform *"knowledge-based work that is inaccessible to those lacking the required training and experience"* (Plochg, Klazinga, & Starfield, 2009, p. 2); thus, the relationship between professionals and managers used to be characterised more by *trust* than *control* (Freidson, 2001; Van Herk, Klazinga, Schepers, & Casparie, 2001). Trust in the self-management abilities of individual professionals versus trust in the profession (as an institution) to control their members. This trust is the foundation of professional autonomy (Freidson, 2001). However, two factors appear to have changed. First, because of the introduction of evidence-based medical standards (guidelines and protocols) by professions, the knowledge domain of health professionals has become more accessible for outside control (Van Herk et al., 2001). Second, trust appears to have eroded in regard to safety issues. The publication of reports, such as *To err is human* (Kohn et al., 2000), has shown how easy individual healthcare professionals can make mistakes in the complex, dynamic, multidisciplinary healthcare setting, despite the available internal control mechanisms of the professions. This issue has spurred media attention and the interest of external agencies. It appears that hospital management has therefore decided to step in and take more control of safety issues. Although there are differences in the level of control, in each of our hospitals control-based management is

now the foundation for safety management. Even hospitals that exhibit less management control have not returned to the 'old' relationships of 'trust'. Safety is not trusted via individual self-management of professionals; it is expected to be anchored in the collective structure and culture of the organisation. There is also no 'blind' trust in the profession (as an institution) to control their members. Management control is only loosened if professionals have visible mechanisms in place to control each other.

A generally accepted thought in HRM literature (e.g., Arthur, 1994; Walton, 1985) is that organisations primarily rely on either control- or commitment-based management. However, it appears that hospitals consider control- and commitment-based management to be complementary rather than mutually exclusive in regard to patient safety management. This idea is consistent with the approach promoted by safety experts. In regard to safety, hospitals have learned lessons from so-called high-risk and high-reliability organisations, such as military and civil aviation and nuclear power-generation plants (Weick, Sutcliffe, & Obstfeld, 2008). In high-risk organisations, operational processes are generally established in rules and procedures, and compliance is enforced by threats of disciplinary measures (Gaba, 2000). Additionally, high-risk organisations focus on designing systems that are capable of the prevention of errors (Karsh, Holden, Alper, & Or, 2006). To this end, these organisations standardise work processes and create conditions that reduce errors and increase reliability. However, healthcare organisations have come to realise that they have characteristics that hinder strict adherence to safety rules and procedures, as they face high levels of complexity, uncertainty and variation in medical situations (Katz-Navon et al., 2007). This dynamic environment requires organisations to manage fluctuations and identify different ways to attain reliability (Weick et al., 2008). That is why the so-called high-reliability organisations (HROs), such as aircraft carriers and nuclear power-generation plants, have become examples for hospitals in regard to safety. These organisations combine attention for system design and procedures with reliance on employees' abilities to handle safety risks (Weick et al., 2008). HROs are characterised by an ongoing focus on safety risks, situational awareness and the capacity to cope with unanticipated failures (Weick et al., 2008). These features require organisations to shift towards a commitment-based management approach and to create awareness and demonstrate the priority attached to patient safety. Thus, whereas the HRM literature describes control- and commitment-based management as two extremes in a management spectrum, safety management favours the combination of both approaches to ensure patient safety. HROs are known as organisations that face high-risk environments, but are able to guarantee safety over a long period of time (Weick & Sutcliffe, 2001). Whether this is also the case for patient safety in hospital-settings remains unknown.

This study has some limitations that support the need for future research. First, this study exclusively focuses on hospitals that are located in the Netherlands. Therefore, the generalisability to other healthcare contexts or countries may be low. However, the

Netherlands can also be considered an interesting case because in contrast to the overall rather slow improvement in patient safety (Landrigan et al., 2010; Leape et al., 2009), a fifty percent reduction in the number of preventable deaths has been attained in the previous few years (Langelaan et al., 2013). Future research may examine which (combination of) management approach(es) contributes to the achievement of this result, and in general, what the effects of control- and commitment-based management are on patient safety. Second, only respondents in a managerial position or respondents with a leading role in safety management were interviewed, which did not consider the view of healthcare professionals. The focus on key-informants is consistent with the explorative nature of this study; however, in future research, it may also be interesting to include healthcare professionals' opinions because Wright & Nishii (2006) demonstrated that the managers' perceptions concerning the 'actual' management practices that have been implemented may differ considerably from the employees' perceptions and subsequent interpretations of the adopted management approach.

In conclusion, both control- and commitment-based management are relevant for patient safety management in hospitals. Whereas the HRM literature describes that organisations focus either on control- or commitment-based management, our results demonstrate that hospitals use a combination of both management approaches. Some hospitals focus more on control-based management, whereas other hospitals emphasise elements of commitment-based management. Once hospitals emphasise commitment-based management, they do not completely abandon control; however, the balance shifts from managerial towards professional control. The results also identified that the combination of management approaches varies between and within hospitals (e.g., depending on differences in the departments, management positions or job categories), as well as over time (e.g., depending on crisis situations and circumstances that distract hospital's attention from patient safety). Thus, hospitals use a dynamic interplay of elements of both management approaches to manage patient safety.

Chapter 3

The influence of environmental conditions on safety management in hospitals: A qualitative study

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ABSTRACT

Background: Hospitals are confronted with increasing safety demands from a diverse set of stakeholders, including governmental organisations, professional associations, health insurance companies, patient associations and the media. However, little is known about the effects of these institutional and competitive pressures on hospitals' safety management. Previous research has shown that organisations generally shape their safety management approach along the lines of control- or commitment-based management. Using a heuristic framework, based on the contextually-based human resource theory, we analysed how environmental pressures affect the safety management approach used by hospitals.

Methods: A qualitative study was conducted into hospital care in the Netherlands. Five hospitals were selected for participation, based on organisational characteristics as well as variation in their reputation for patient safety. We interviewed hospital managers and staff with a central role in safety management. A total of 43 semi-structured interviews were conducted with 48 respondents. The heuristic framework was used as an initial model for analysing the data, although new codes emerged from the data as well.

Results: In order to ensure safe care delivery, institutional and competitive stakeholders often impose detailed safety requirements, strong forces for compliance and growing demands for accountability. As a consequence, hospitals experience a decrease in the room to manoeuvre. Hence, organisations increasingly choose a control-based management approach to make sure that safety demands are met. In contrast, in case of more abstract safety demands and an organisational culture which favours patient safety, hospitals generally experience more leeway. This often results in a stronger focus on commitment-based management.

Conclusions: Institutional and competitive conditions as well as strategic choices that hospitals make have resulted in various combinations of control- and commitment-based safety management. A balanced approach is required. A strong focus on control-based management generates extrinsic motivation in employees but may, at the same time, undermine or even diminish intrinsic motivation to work on patient safety. Emphasising commitment-based management may, in contrast, strengthen intrinsic motivation but increases the risk of priorities being set elsewhere. Currently, external pressures frequently lead to the adoption of control-based management. A balanced approach requires a shift towards more trust-based safety demands.

BACKGROUND

Healthcare organisations are confronted with increasing safety demands from a diverse set of stakeholders (Wachter, 2010), including governmental organisations, professional associations, health insurance companies, patient associations and the media. In this multidimensional or layered environment hospitals have to deal with various coexisting institutional and competitive pressures (Scott, Ruef, Mendel, & Caronna, 2000; Van de Bovenkamp, de Mul, Quartz, Weggelaar-Jansen, & Bal, 2014). The systems approach claims that these environmental conditions influence the shaping of organisational policies and procedures, which affect the work processes of healthcare professionals who try to provide the safest possible care to their patients (Berwick, 2002). However, little empirical research has been done on the actual consequences of various environmental conditions for safety management in healthcare (Van de Bovenkamp et al., 2014).

Previous research has shown that organisations generally shape their safety management approach along the lines of control- or commitment-based management (Alingh, van Wijngaarden, Paauwe, & Huijsman, 2015; Khatri, Baveja, Boren, & Mammo, 2006). The former is a formalised, top-down approach that focuses on regulating work processes, monitoring professional behaviours and providing employees with feedback on their level of compliance (Boselie, 2002; Walton, 1985). In contrast, commitment-based management focuses on facilitating an internalisation of safety norms and values in employees (Arthur, 1992; Khatri et al., 2006), by creating awareness of safety risks, stressing the priority of safety within the organisation and encouraging employees' ownership in safety management (Alingh et al., 2015). Each approach might have its merits in optimising safety (Zohar, 2008), and both may be required in professional organisations, such as hospitals.

To understand the relationship between environmental conditions and organisations' management approach, Paauwe developed the contextually-based human resource (HR) theory (Paauwe & Farndale, 2017; Paauwe, 2004). This framework describes how environmental conditions influence the shaping of HR management, incorporating institutional pressures, competitive drivers, and the historically grown configuration of an organisation. Moreover, it combines a systems approach with an actor perspective that stresses the role of strategic agency within organisations. Depending on the room to manoeuvre that organisations experience, the individuals or groups who hold decision-making power within the organisation (*i.e.,* the dominant coalition) may opt for various strategically chosen responses while shaping management policies and procedures (Oliver, 1991). In this article we will adapt this framework to patient safety, since environmental conditions and strategic responses of organisations are considered to be issue-specific (Kostova & Roth, 2002).

Management policies and practices are, first, subject to the influences of institutional mechanisms. Institutions reflect sets of rules, norms or belief systems which provide stabil-

ity and meaning to social life (Scott, 2014), and which are "*the rules of the game*" (Kraatz & Block, 2008, p. 243) that direct and control organisational behaviour. According to new institutionalism (DiMaggio & Powell, 1983), organisations conform to these institutional pressures in order to gain legitimacy and to improve their chances of survival (Greenwood & Hinings, 1996; Meyer & Rowan, 1977). As a consequence organisations acting in similar contexts become more and more homogeneous. This isomorphic change results from three mechanisms (DiMaggio & Powell, 1983). First, *coercive* mechanisms derive from cultural expectations in society and (in)formal pressures from institutions on which the organisations are dependent. Prototypically, stakeholders such as governmental agencies demand organisations to adopt specific practices and have the ability to punish non-compliance. Second, *mimetic* mechanisms originate from uncertainty which drives organisations towards imitating practices of successful competitors or 'best practices'. Finally, *normative* mechanisms arise from professionalisation as professional networks and training programs develop and spread professional norms and values.

Whereas seeking legitimacy may drive organisations towards institutional isomorphism, an economic rationality of efficiency and effectiveness, may steer organisations either in the direction of competitive isomorphism or towards differentiation. Exposure to similar market conditions and endeavours to improve efficiency or to keep up with competitors may lead to similarities in organisational practices and systems (DiMaggio & Powell, 1983). Organisations may, for example, benchmark themselves against each other and imitate competitors' policies and practices which are promising for delivering desirable outcomes. However, strategic management scholars (e.g., Barney, 1991; Porter, 1991) advocate that organisations should 'be different' in order to gain a competitive advantage. The transition to regulated competition through market-oriented healthcare reforms, forces hospitals to compete on both quality and price, which may stimulate them to differentiate based on safety management and performance.

In addition to influences of institutional and competitive mechanisms, the historically grown configuration of an organisation has a role in shaping management policies and practices as well (Paauwe, 2004). The configuration reflects a unique path-dependent pattern of organisational characteristics, structures, competences and values, which is also referred to as the administrative heritage (Bartlett & Ghoshal, 1989). According to Delery & Doty's (1996) configurational approach, organisations need to align their management policies and practices with the administrative heritage in order to be effective. Veld (2012) studied the historical configuration of hospitals in the Netherlands and found that it is characterised by ongoing mergers and reorganisations, a highly professionalised workforce, status differences between disciplines, and the autonomous position of medical specialists. In the Netherlands, the majority of medical specialists are, for example, employed in independent partnerships and hold a relatively independent position in the managerial hierarchy, making it hard to control their behaviours. Nevertheless, they have

considerable formal and informal power in hospital policy and management, since the hospital needs their commitment in order to achieve its objectives.

How the dominant coalition deals with these environmental conditions depends on the room to manoeuvre or leeway that organisations experience to opt for various strategic responses. The dominant coalition may mitigate the relationship between environmental conditions and the organisation by obtaining a degree of leeway for shaping management policies and practices. This room to manoeuvre is affected by several factors, including the financial health of the organisation (Paauwe, 1991), the dependency relationships with external stakeholders (Oliver, 1991), and actors' sense-making of environmental pressures and their interpretation of what is considered appropriate behaviour (Raaijmakers, Vermeulen, Meeus, & Zietsma, 2015). Moreover, internal dynamics in the dominant coalition in terms of interests, values and power dependencies may also influence the room to manoeuvre to make strategic choices (Pache & Santos, 2010). According to the strategic balance theory (Deephouse, 1999), organisations make strategic choices *"to be [either] more differentiated from or more similar to its competitors"* (Farndale & Paauwe, 2007, p. 359) in order to achieve a balance between requirements of stakeholders, pressures for legitimisation and competition. Hence, although institutional pressures have the power to force organisations to adopt certain practices, actors within the organisation still have ample room to enact agency (Heugens & Lander, 2009). Oliver (1991) distinguishes five manifestations of organisational agency. First, organisations could passively conform to institutional requirements. Second, under conditions of conflicting demands or inconsistencies between external expectations and internal objectives, organisations could compromise by balancing or bargaining the demands. Moreover, they may choose to buffer or decouple themselves from institutional pressure by 'ceremonial' implementation; pretending conformity without true believe or shared values by the members of the organisation (Meyer & Rowan, 1977). In other words, ceremonial implementation concerns relatively high levels of implementation accompanied by low levels of internalisation (Kostova & Roth, 2002). The fourth strategic response is a more active form of resistance in which organisations ignore, challenge or attack institutional norms and expectations. And finally, organisations may choose to manipulate demands by a purposeful and opportunistic attempt to co-opt, influence, or control institutional pressures (Oliver, 1991). Formulated in a more positive way, they have the opportunity to 'lead', 'initiate' or 'develop' strategic responses to environmental demands (Paauwe, 2004) or they may seek to bring about institutional change; also referred to as institutional entrepreneurship (Garud, Hardy, & Maguire, 2007). Hence, actors within an organisation who have an interest in particular institutional arrangements may exercise power and attempt to actively transform existing institutional arrangements and create new ones.

The aforementioned organisational responses imply that, in the end, the dominant coalition makes strategic decisions; thus, shaping management policies and practices.

The current study aims to develop a deeper understanding how the combination of institutional, competitive and configurational factors as well as internal issues of strategic choice influences the shaping of safety management approaches of healthcare organisations. During a qualitative study conducted in five hospitals in the Netherlands, Paauwe's contextually-based HR theory is used as a heuristic framework (see Figure 1) (Paauwe & Farndale, 2017; Paauwe, 2004).

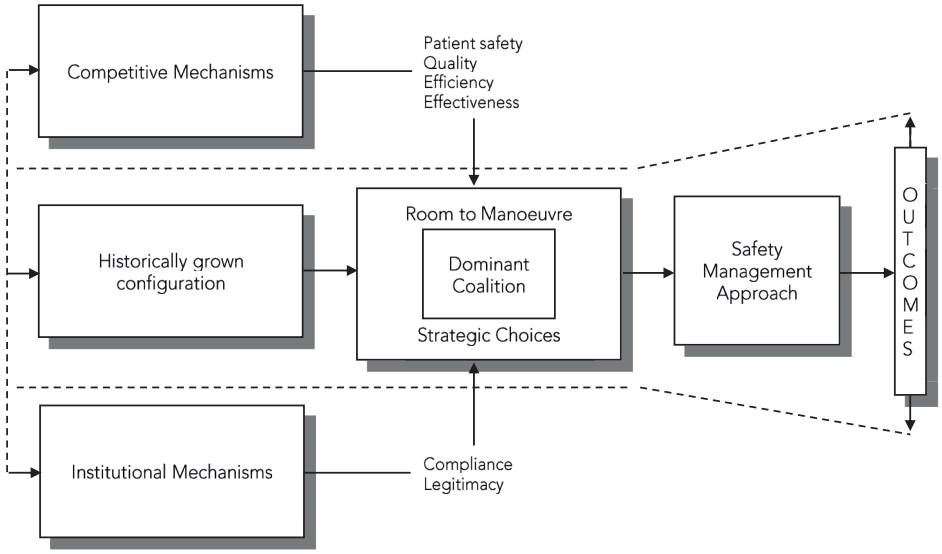

Figure 1 Heuristic framework, based on the contextually-based HR theory
Note: adapted from Paauwe (2004).

METHODS

We selected five hospitals in the Netherlands, based on organisational characteristics as well as their variation in reputation for patient safety. We interviewed hospital managers and staff with a central role in safety management. Our study was outside the scope of the Netherlands' Medical Research Involving Human Subjects Act, therefore no ethical approval was required from a Medical Ethical Committee (CCMO, 2017).

Research setting

Hospital care in the Netherlands is delivered in private, not-for-profit care organisations. Since the introduction of the Health Insurance Act in 2006, the organisations are subject to a system of so-called regulated competition. On the one hand, health insurers pur-

chase healthcare and negotiate with providers on both quality and price, while on the other hand the government governs at a distance in order to guarantee universal access to high-quality care (Schäfer et al., 2010). As a result, hospitals are subject to a wide variety of requirements which may influence how they manage patient safety.

In 2013, a total of 89 Dutch hospitals existed, which could be categorised into university medical centres, top-clinical teaching hospitals and general hospitals (Dutch Hospitals Association, 2014). A combination of general and top-clinical teaching hospitals were considered for inclusion in the study (see Table 1); university medical centres were excluded because of the great degree of organisational complexity of these organisations (including research and education). Moreover, variation was sought in hospital size as well as organisations' safety performances. Performance scores were derived from publicly available ranking lists (i.e., Elsevier rankings) and consisted of a combined score of various safety performance indicators (e.g., process indicators on patient identification and the screening of pressure ulcers). Since the ranking lists have been criticised for fluctuation over time (Pons, Lingsma, & Bal, 2009), the scores of three successive years have been combined. The five participating hospitals were selected using stratified purposeful sampling (Patton, 2002), and provided a reflection of the variation in hospital size and safety reputation across all Dutch general and top-clinical teaching hospitals.

Table 1 Case characteristics of the five hospitals

	Hospital A	Hospital B	Hospital C	Hospital D	Hospital E
Type of hospital	Top-clinical	Top-clinical	General	General	Top-clinical
Hospital size (no. of beds)	<500	750-1000	500-750	500-750	>1000
Safety performance†	Low	Low	Low	Mediocre	High

† Safety performance has been reported on a scale that ranges from 1 to 4. Scores < 2 are indicated as low, scores of 2-3 are indicated as mediocre and scores > 3 are indicated as high.

Data collection

In order to gain deep insights into the phenomenon of interest, semi-structured interviews were conducted with respondents who occupy a central role in safety management and who work at different hierarchical levels within the organisation (Eisenhardt & Graebner, 2007). From September 2013 to April 2014, a total of 43 interviews were conducted with 48 respondents (some interviews were duo-interviews), including (chief) patient safety officers, members of the board of directors, members of the medical advisory board, medical managers, business unit managers and nurse managers or team leaders (see Table 2). All of the respondents were (directly) involved in safety management and could give insight into the reasons underlying the choice for different safety management approaches. By purposefully selecting respondents who hold different managerial positions

and who work at different hierarchical levels, we aimed to gain broad insight into varying viewpoints in the dominant coalition on how internal and external contextual features combine to influence the shaping of safety management approaches across hierarchical levels. After all, how strategic-level managers respond to institutional, competitive and configurational factors might differ from the choices made by managers at tactical or operational hospital levels.

Table 2 Number of respondents per function

	Hospital A	Hospital B	Hospital C	Hospital D	Hospital E	Total
(Chief) patient safety officer	1	2	3	1	1	**8**
Board of directors	1	1	1	1	1	**5**
Medical manager / advisory board	2	2	2	4	4	**14**
Business unit manager	2	2	1	0	2	**7**
Nurse manager	4	2	2	3	3	**14**
Total	**10**	**9**	**9**	**9**	**11**	**48**

The interviews were structured around the constructs underlying the contextually-based HR theory (Paauwe & Farndale, 2017; Paauwe, 2004). Respondents were, first, asked to describe how patient safety is managed and what safety interventions are applied in their department or hospital. Subsequently, the interview addressed environmental conditions and relevant trends in the hospital context that might have influenced the safety management approach. Respondents were, for example, asked *what* developments took place in the healthcare context (e.g., institutional or competitive mechanisms) or in their own organisation that might have influenced how they manage patient safety. In addition, the interview focused on *how* these developments affected the safety management approach and how organisations responded to environmental conditions; in other words, did hospitals experience room to manoeuvre? Finally, respondents were asked to elaborate on *why* hospitals opted for specific strategic responses in reaction to demands from stakeholders in their environment.

Data analysis

All interviews were audio-recorded and transcribed verbatim. The transcripts were analysed using qualitative data analysis software Atlas.ti to conduct a thematic analysis. First, the researchers familiarised themselves with the data by (re)reading transcripts and identifying *"patterns of meaning and issues of potential interest in the data"* (Braun & Clarke, 2006, p. 86). Second, initial codes were generated to identify topics of interest. To identify codes, deductive- and inductive-coding were combined. The initial list of codes consisted of key-elements of the conceptual framework (Paauwe & Farndale, 2017;

Paauwe, 2004), and included codes such as 'competitive mechanisms', 'dominant coalition', and 'room to manoeuvre'. However, the researchers remained open for codes that emerged from the data and searched for specifications of initial codes. For example, the initial code 'competitive mechanisms' covered elements such as 'purchasing healthcare by insurance companies', 'publically available ranking lists' and 'benchmarking'. Whereas the initial code 'room to manoeuvre' was further specified by factors which influence the experienced leeway, such as 'tightness of external supervision' and 'relevance of safety requirements'. Furthermore, new codes emerged from the data, such as 'critical safety incidents'. In the end, all codes were combined into broader (sub)themes, which were based on similarities in data as well as theory. The final themes structure the results presented in this paper.

RESULTS

Dominant coalition shapes safety management

Although the formal responsibility rests with the board of directors, all hospitals in this study established a structure of shared responsibilities and joint decision-making on hospital-wide safety policies and practices: *"Together with the board of directors, the medical advisory board takes decisions on many organisational issues. For all topics related to the national programme 'Prevent Harm, Work Safely', an action plan is, for example, presented which is approved by both of them"* (chief patient safety officer, hospital C). Medical specialists have a powerful voice in these decision-making processes, especially in case of care-related matters such as patient safety. *"There is no board of directors of a Dutch hospital who does something that doctors don't want to, because then your days as a board member are simply numbered"* (member of the medical advisory board, hospital A). Remarkably, nurses, who have a central role in care delivery and who form a significant part of the hospital staff, are not closely involved in shaping hospital-wide safety policies and practices.

With regard to departmental safety issues, a similar pattern of shared responsibilities was found. *"Together with the medical manager, as a duo we are responsible for taking care of and ensuring patient safety [in our department]"* (business unit manager, hospital E). Departmental safety policies and practices are deeply influenced by choices made at the hospital level. Nonetheless, business unit managers, medical managers and nurse managers still have some leeway for shaping safety management within their own department.

Institutional demands

The studied hospitals are subject to coercive pressures resulting from requirements and expectations of the Dutch Healthcare Inspectorate, safety legislations, government initiatives and accreditation committees. The Dutch Healthcare Inspectorate has, for example, the authority to keep hospitals under 'stringent supervision' or even close a department or organisation that does not meet safety requirements. *"If the inspectorate takes steps to enforce compliance and you do not follow a guideline […], they say you do not work safely or you work on the brink of what is considered acceptable. Then the Inspectorate enforces you to improve things within a month, or the department will be closed"* (chief patient safety officer, hospital B). In line with this, the Inspectorate supervises hospitals by undertaking site visits and by discussing safety performance indicators which provide insight into the safety of care processes.

Rather than punishing non-compliance, hospitals may also be forced in more subtle ways to meet safety requirements. For example, hospital accreditations let independent committees check whether hospitals comply with a set of (minimum) safety standards. These accreditations shifted from voluntary participation to a required standard in order to gain legitimacy in the hospital field. Something similar is the case for the national programme 'Prevent Harm, Work Safely' which was a joint initiative of the government and professional associations, offering hospitals tools and best practices for certain high-risk patient safety problems like surgical site infections or medication errors. Whereas the programme was primarily intended to encourage safety improvement, hospitals were eventually expected to adopt specific practices and to reach accreditation on how they manage safety risks. *"When you combine the national programme 'Prevent Harm, Work Safely' with a system of auditing and accrediting hospitals, there is no escape anymore"* (member of the board of directors, hospital D). So, the choices of the dominant coalition are, first of all, influenced by coercive pressures resulting from expectations of the organisational field and demands from stakeholders that have the ability to enforce certain safety behaviours.

Secondly, safety management is also influenced by normative mechanisms deriving from professional norms and regulations. In professional training programmes, healthcare professionals are socialised to strive for safe care, to work fairly independent of external control mechanisms and to rely on self-judgement. As a result, *"Every doctor is convinced that he delivers high-quality care and that he works safely. […] It is a very isolated world, the medical world"* (medical manager, hospital B). Moreover, medical professional associations establish evidence-based clinical protocols and guidelines on how to deliver safe care: *"All rules of the game concerning patient safety are established by our professional associations, […] for example on how to apply hand hygiene"* (chief patient safety officer, hospital B). These normative regulations do not only contribute to safety management

in itself, some of them are also adopted by the Healthcare Inspectorate or accreditation committees which enforce compliance with the protocols or guidelines.

Finally, the studied hospitals do also use mimetic mechanisms by seeking inspiration from other high-risk industries while shaping safety management. For example, different hospitals are inspired by successful initiatives from aviation or petrochemical industry. *"One of the actions that is currently taken is that I will try to find a way to change the speaking up culture together with the guy who is running the speaking up project at Shell"* (member of the medical advisory board, hospital E).

Competitive mechanisms

The choices made by the dominant coalition are also affected by competitive mechanisms deriving from the healthcare market. First, health insurers play a major role in the healthcare market, since they negotiate with hospitals on both quality and price of the care that is provided: *"They [health insurers] do not purchase certain types of care if you do not meet their quality standards"* (member of the board of directors, hospital C). As a result of the dominance of health insurers, hospitals typically experience little leeway to deviate from their safety requirements. Even though, hospitals generally experience that insurers mostly focus on financial aspects and cost reduction: *"Health insurers state that quality and safety are really important, but in the meantime they negotiate till there is no meat left on the bone"* (patient safety officer, hospital C). As a consequence, hospitals are on the one hand stimulated to focus on patient safety, while on the other hand they experience limited financial resources to allocate to safety management.

In addition, hospitals do also feel a sense of urgency to work on patient safety because patients become better informed and critical customers, since news and social media report on serious safety incidents, patient experiences and ranking lists on hospitals' quality and safety. A bad reputation of a hospital reflects badly on the professionals involved: *"Doctors don't like to explain at a birthday party why they, as a hospital, are number 88 [in a top 100 ranking list]"* (medical manager, hospital B). Negative publicity may also have more serious consequences in the current Dutch market system: *"If we do not provide good care we will not get any clients or patients. Then the hospital will earn no money"* (member of the medical advisory board, hospital C).

Thirdly, safety management is also influenced by inspiration drawn from comparisons with competitors. Although benchmarking patient safety data is not yet common sense on hospital level, some intensive care units and surgical departments do compare their safety processes and outcomes with similar departments in other hospitals, sometimes even internationally. *"Especially in orthopaedics, infection rates are closely monitored and also compared with comparable hospitals. […] In case our infection rates are lower, great, how can we further improve our performances? When our rates are higher, guys what is happening, what is going wrong here?"* (nurse manager, hospital A). Thus, a poor

benchmark outcome motivates professionals to improve their safety performances and to learn from competitors.

Finally, hospitals' attempts to differentiate themselves from competitors may also affect how they manage patient safety. In general, hospitals say they do not feel a strong need to differentiate themselves regarding patient safety, since patient safety is considered a basic requirement for providing healthcare. *"In our opinion, we should not compete for quality or safety, because the quality and safety should be guaranteed [in all hospitals], we do not want to use it for competitive advantage* (member of the board of directors, hospital D). Nevertheless, hospitals did start to make a name for themselves. Two hospitals try, for example, to demonstrate greater openness and transparency than their competitors about the safety and outcomes of provided care. Moreover, most hospitals try to differentiate themselves by devoting attention to specific groups of patients. *"We pretend to be a hospital for elderly. Well, you cannot pretend this when your performance on the prevention of pressure ulcers is so disappointing"* (member of the board of directors, hospital C). In line with this, all studied hospitals try to gain specific quality marks (e.g., for frail elderly) that may serve as a marketing tool for the care that the organisation delivers. So, the strategic choices of a hospital also influence their safety management.

Experienced room to manoeuvre

How the dominant coalition deals with the institutional and competitive environment is influenced by the room to manoeuvre that a hospital experiences, which is in turn affected by hospital's interpretation of safety requirements from external stakeholders as well as characteristics of the historically grown configuration of an organisation.

An important factor that influences the experienced room to manoeuvre is the tightness of external supervision. If external stakeholders impose more frequent or unexpected supervisory controls, hospitals face a higher risk of disclosure of non-compliance, leading to actions that might harm the organisation. Given the fact that hospitals want to reach accreditation, they experience, for example, little room to manoeuvre at the time of an accreditation visit; at that moment, they all try to perfectly meet the safety requirements. However, once a hospital is accredited, the experienced room to manoeuvre increases since the accreditation committee will not perform safety checks again until a next accreditation visit. As a nurse manager (hospital A) explained: "*In case of an accreditation visit, all of a sudden [all policies and procedures] are in order, but when the accreditation committee has left, everything collapses into a heap again"*. Comparably, departments in two of the studied hospitals were recently kept under close supervision of the Dutch Healthcare Inspectorate and experienced little room to manoeuvre: *"Our hospital has been checked by the Inspectorate and, at first, they did not give approval. […] Well, know that a manager visited our department and said make sure that everyone complies with all requirements, otherwise the hospital will be in big trouble"* (nurse manager, hospital

B). In contrast, a recent positive evaluation could increase the experienced room to manoeuvre: *"Now that the Inspectorate is satisfied [with our performances] they may focus their attention to other hospitals"* (member of the medical advisory board, hospital E).

In addition, the experienced room to manoeuvre is also determined by the consequences of not meeting safety requirements (e.g., in terms of legitimacy or financial health). All studied hospitals feel a strong need to comply with requests made by health insurers, since the financial situation of a hospital is largely dependent on insurers' willingness to purchase healthcare. *"For a while, I thought I am not going to respond [to all requests made by health insurers], but I have been rebuked by some members of the organisation who said, and they are right though, we have to get our money from that club"* (member of the board of directors, hospital A). In contrast, hospitals do also face external safety demands for which it is less obvious that the requirements have to be met. The consequences of not gaining a specific quality mark are, for example, less harmful for an organisation; thus, members of the dominant coalition experience more leeway to strategically choose whether they want to meet the criteria that such quality marks entail or not. *"Some quality marks are really important, but there are also a few that have little added value. […] Therefore, when a new quality mark is introduced we have to assess whether we want to gain it, […] what are the costs and what are the benefits?"* (business unit manager, hospital A).

The room to manoeuvre that the dominant coalition experiences is also influenced by the perceived relevance and practicality of demands that are imposed on the organisation. All studied hospitals employ a highly professionalised workforce that is socialised to strive for error-free care delivery and is professionally driven to improve patient safety. Hence, the more relevant a requirement is perceived to be, the less room to manoeuvre the dominant coalition experiences. *"If you are able to show that a lot of errors are made on a specific issue and that you found a manner to actually avoid major errors, to avoid clinically relevant errors, then I think you will not hear anyone"* (member of the medical advisory board, hospital D). Thus, the perceived relevance depends on how serious safety problems are and how effective the safety requirements are perceived to be. Moreover, if hospitals face concrete and detailed safety requirements that can be easily incorporated in standard work processes they seek less room to manoeuvre.

Finally, the experienced room to manoeuvre is also affected by the historically grown configuration (i.e., the outcome of choices and responses to issues that the organisation had to deal with in the past). More specifically, it is influenced by the existence of a safety culture in which hospitals favour patient safety over other organisational aspects (e.g., production or finance). Some of the studied hospitals devote high priority to patient safety, because safety is closely linked with their organisational heritage or because of critical incidents in the past. A couple of years ago, one of the studied hospitals was, for example, confronted with media attention on hygiene problems as well as a persistent

hospital infection. These incidents triggered awareness of patient safety and gave safety efforts new urgency and greater priority within the organisation. *"Of course, it was terrible that we were visited by a television show that used a hidden camera [which revealed hygiene problems], but it caused an enormous cultural change. […] Everyone was well aware that certain things had to change"* (nurse manager, hospital E). Hence, a culture was fostered in which the hospital strived for ongoing improvements in patient safety and nowadays the dominant coalition experiences more leeway to put their own spin on how they manage safety issues. This is in contrast with hospitals that are confronted with issues that distract their attention from patient safety, such as financial problems, a fall in production or a merger. Because of these issues, two of the studied hospitals gave priority to dealing with the financial situation of the organisation – "*Ninety percent of our time we talk about money and about budget cuts"* (member of the board of directors, hospital B). They seek little room to manoeuvre; unless it would help them to save time that was spent on patient safety.

Strategic responses

Depending on the room to manoeuvre that hospitals experience, the dominant coalition has a choice from various strategic responses (e.g., compliance, balancing or initiating change) on how they deal with external safety requirements. Whether the experienced room to manoeuvre is actually *utilized* depends on two things. First, the motivation and individual agency shown by members of the dominant coalition – in other words, do individuals have a personal drive to work on patient safety, do they feel responsible and do they dare to take a risk by deviating from external safety requirements. Second, the occurrence of safety incidents or near misses (i.e., unintended safety events that did not cause injury or damage to a patient, but that had the potential to do so) that trigger awareness for safety issues in the organisation at short notice.

The results of this study show that all studied hospitals comply with the majority of external demands regarding patient safety, both in terms of adopting safety practices or procedures and by providing required information for external accountability. However, different levels of compliance can be distinguished. In general, we found that hospitals fully comply with safety requirements if the directives are considered relevant and valuable for improving patient safety. *"Things like the surgical time-out procedure were imposed top-down, but they do contribute to reducing safety problems. They clearly cover a weak spot […, so, that is something of which] we say, we just have to do it"* (member of the medical advisory board, hospital D). Full compliance with safety directives is also fostered by tight external supervision and serious consequences if requirements are not met. Moreover, it is facilitated if internal representatives of the various stakeholders actively support and stimulate the adoption of safety practices. Medical specialists who are in

favour of certain safety improvements have, for example, an important role in gaining acceptance among their peers.

All studied hospitals also try to balance the useful directives of external stakeholders with the needs and practical experiences of their own employees, as they give healthcare professionals the opportunity to customise practices and procedures in order to fit the local circumstances. *"If really good arguments are presented of which healthcare professionals say this in particular makes things difficult, or we think we can arrange things better that way, […] then a protocol […] or procedure can be modified"* (nurse manager, hospital C). Modifications are mostly made in case of low practicality. Respondents argue, for example, that some of the evidence-based clinical protocols and guidelines issued by medical professional associations are so detailed and prescriptive that they do not always work out in practice. *"Clinical guidelines are rather frequently established by some kind of desk officers. These persons do work in hospitals, but often in academic centres which typically might be somewhat more precise in working conform evidence […]. However, maybe not always having medical practice in mind, especially of hospitals that treat a great amount of patients"* (member of the board of directors, hospital E). As a result, proposed safety requirements are not always in line with local circumstances in a hospital and may, consequently, lead to resistance to conform. Therefore, all studied hospitals offer their professionals the possibility to modify certain parts of the protocols and guidelines if they present good arguments to do so.

In addition, ceremonial implementation of safety requirements is used on a regular basis in all studied hospitals. Hospitals simply try to meet external requirements without fully acknowledging and internalising the need for these practices, because they are not so much willing or able to devote time and efforts to adopting certain practices. *"We noticed that, if we once again receive a new evaluation framework, we somewhat forced start ticking the boxes. […] A bit like we have to comply with this one, and this, and that, rather than thinking through the risks involved"* (member of the board of directors, hospital E). Ceremonial implementation is also demonstrated by required policies and procedures that do exist on paper, while the underlying changes in safety management or professional behaviours are not fully put into practice. *"On the outside, all policies and procedures show that we have things in order […], the bureaucrats here in the hallway do as much as they can. However, how are things experienced at the shop floor? Well, that is a problem"* (member of the board of directors, hospital B). This form of ceremonial implementation is chosen if supervisory agencies check whether hospitals established certain (written) procedures of which healthcare professionals within the organisation consider the practical relevance to be low. Given the fact that organisations do not want to face sanctions, they choose for ceremonial implementation.

Overall, the studied hospitals do not give the impression that they often ignore or actively challenge safety demands. Even though hospitals do complain about the multitude

and detail of safety requirements, they feel that it is almost impossible to abandon required practices and procedures because of the consequences of not meeting demands and since it is hard to offer collective resistance. However, on a small scale, some hospitals or departments do ignore safety requirements which they consider to be irrelevant. *"We had to develop a checklist on how to insert a central venous catheter line [in order to avoid infections …] but we had zero sepsis, for many years already! Then I said I am not going to make a checklist, I refuse to do so"* (nurse manager, hospital D). Moreover, some hospitals develop and discuss alternative approaches to mitigate identified safety risks: *"[Some safety procedures include] elements where we deliberately deviate from external requirements. […] We also discuss these things with the Dutch Healthcare Inspectorate, […] we just want to provide them with feedback on our practical experiences and how we arrange things differently"* (member of the board of directors, hospital E). Whether the dominant coalition undertakes such initiatives depends on the experienced room to manoeuvre. Hospitals that are highly dependent on approval of external stakeholders will not so easily challenge or ignore their requirements. In contrast, hospitals that recently received credits for their safety efforts and that give high priority to patient safety will more easily dare to stand out and will make more use of the experienced room to manoeuvre to challenge external safety requirements.

Finally, hospitals choose to take initiative in formulating and reshaping their safety management approach. Taking initiative requires room to manoeuvre and a pro-active role of members of the dominant coalition; characteristics that are often not so much fostered by external safety requirements. *"Organisations are increasingly pushed to take their own responsibility. However, this presupposes trust, whereas basically all imposed safety systems are created based on distrust"* (member of the board of directors, hospital D). Thus, initiating safety-related change assumes an intrinsic motivation to work on patient safety. In all studied hospitals, safety incidents or poor benchmark outcomes stimulate both healthcare professionals and members of the dominant coalition to implement safety policies and procedures that are not covered by or go beyond external requirements. *"We found out that, [compared to other hospitals], we had a higher chance of some kind of infection, which is really bad for a patient. Well, that launches a big drive to say we just have to set out very strict rules […], and we actually have to be even more strict than all those external requirements"* (member of the board of directors, hospital E). The degree to which further safety initiatives are developed varies across hospitals, based on the priority attached to patient safety and the level of individual agency shown by members of the dominant coalition. If hospitals have a culture which favours patient safety and when individuals in the organisation have a strong personal motivation, they take more initiative to put their own spin on how they manage several safety issues.

Safety management approach

Different combinations of environmental conditions and strategic responses stimulate the adoption of either a control- or a commitment-based management approach.

The dominant coalition tends to adopt a control-based management approach when they experience little room to manoeuvre and expect healthcare professionals to lack the intrinsic motivation to comply with safety requirements. Concrete and practicable safety requirements that are accompanied by tight external supervision and serious consequences when requisites are not met, are frequently incorporated in internal planning and control cycles and mostly give rise to a control-based management approach. *"Once every three months, we discuss the indicators [for which we are accountable to external stakeholders] with the board of directors. […] And if these indicators are not above the norm, then critical questions will be asked about it"* (nurse manager, hospital C). Especially, if professionals do not show full commitment to safety requirements and if compliance is not taken for granted, members of the dominant coalition monitor and control healthcare professionals' behaviour. *"It all started with confidence that healthcare professionals would comply. Then we started monitoring, then we applied sanctions. There is pressure on it. It is mandatory. We impose controls and provide people with feedback"* (nurse manager, hospital B). In line with this, a control-based management approach is mostly used if the dominant coalition makes the strategic choice to comply with or ceremonially implement safety requirements. Finally, only in exceptional cases where the dominant coalition experiences high urgency or strong pressure that healthcare professionals have to comply, sanction policies are used as part of a control-based approach. A business unit manager (hospital A) describes, for example, that they established sanction policies for hand hygiene compliance, because evidence had recurrently shown that good hand hygiene provides a sound basis for infection prevention. *"[When it comes to hand hygiene], you may push the boundaries twice, the third time you face a warning and the fourth time you will be fired. That is how important safety is for me. That is how much conforming to the norm is worth for me"*.

In contrast, a commitment-based management approach is generally chosen if the dominant coalition expects safety requirements to generate an intrinsic motivation in healthcare professionals or when they experience plenty room to manoeuvre. If safety requirements are underlined by strong evidence or really target a clinically relevant issue, the dominant coalition typically assumes that a commitment-based management approach will effectively stimulate employees' intrinsic motivation. Hence, the focus is on raising awareness of safety risks and explaining the relevance of safety practices. *"In the end, you want your patients to leave the hospital alive and healthy, they shouldn't be harmed at all. So, I think that is the main motivation, often you only have to explain why you do certain things. […] You have to talk a lot about safety matters"* (member of the medical advisory board, hospital C). Furthermore, the dominant coalition tends to adopt

a commitment-based approach in case of safety demands that are difficult to put into concrete and controllable rules or regulations, and which therefore provide more room to manoeuvre. This is, for example, the case for so-called 'soft skills' such as speaking up behaviour. Speaking up behaviour is hard to enforce and the dominant coalition mostly tries to inspire healthcare professionals to express safety concerns or questions: *"On the one hand, you have to build awareness among nurses that they do have knowledge which they should use [in their collaboration with co-workers, in order to reduce safety risks], while on the other hand you should support them, show role modelling behaviour and emphasise that speaking up behaviour is something that we believe is really important"* (nurse manager, hospital E). Moreover, commitment-based management is used if the medical knowledge and specific expertise of healthcare professionals is needed to minimise safety risks or to put abstract external safety requirements into practicable safety procedures. *"As a manager, I can, of course, state that we score above or below a national average, but I cannot translate things into practical actions. What do we have to change in order to improve our safety performances? Well, that should really come from our employees, they have the expertise"* (business unit manager, hospital B). In these circumstances, the dominant coalition tries to stimulate healthcare professionals to pro-actively come up with new ideas for safety improvement by encouraging employees' sense of ownership of patient safety and by actively inviting them to make safety recommendations. Finally, the adoption of a commitment-based management approach does also require congruence with an organisational culture in which patient safety is prioritised at all organisational levels.

Even though control- and commitment-based management represent the opposite ends of a managerial spectrum, it never is an 'either-or' choice. Following the wide variety of institutional, competitive and configurational conditions as well as internal issues of strategic choice that organisations face, most hospitals simultaneously adopt elements of both management approaches or they alternately introduce elements of control- and commitment-based management in order to ensure patient safety. If the dominant coalition chooses, for example, to comply with safety requirements that they consider relevant, it depends on the pressure exposed by external stakeholders and the consequences that organisations face in case of non-compliance whether the balance shifts towards either a control- or a commitment-based management approach. The greater the pressure that hospitals face, the higher the chance that the dominant coalition chooses to monitor and control healthcare professional behaviours rather than relying on employees' intrinsic motivation. Similarly, if healthcare professionals are offered the possibility to modify certain parts of externally exposed protocols or guidelines in order to make them fit local circumstances, the dominant coalition initially tries to inspire employees to work on patient safety and to encourage their sense of ownership. However, if experience shows that the modified safety requirements are not fulfilled in practice, the dominant coalition

may also choose to combine a commitment-based management approach with elements of control, or to shift the balance entirely towards control-based safety management.

DISCUSSION

This study aimed to develop a deeper understanding of the effects of institutional, competitive and configurational factors as well as internal issues of strategic choice on the safety management approach of healthcare organisations. Results showed that, in all studied hospitals, general managers (e.g., board of directors, business unit managers and nurse managers) and medical specialists have a shared responsibility in decision-making processes on safety policies and practices. The choices that this dominant coalition makes while shaping safety management are strongly influenced by demands from stakeholders in the wider institutional environment and increasingly affected by competitive mechanisms deriving from the healthcare market. How the dominant coalition deals with these safety requirements is influenced by the room to manoeuvre that a hospital experiences. Little room to manoeuvre is experienced when hospitals face tight external supervision and serious consequences when safety requisites are not met or if concrete and detailed safety requirements are set that are perceived to be highly relevant. Under these circumstances, hospitals will mostly choose a strategy of (passive) compliance; they just do what is required to be done. However, if safety demands are seen as irrelevant, hospitals sometimes choose a form of ceremonial implementation in which required policies and procedures do exist on paper, while the underlying changes in safety management or professional behaviours are not fully put into practice. More leeway is experienced if safety demands are abstract and the hospital has an organisational culture which favours patient safety. In these circumstances, hospitals will often try to balance internal and external demands, as they give healthcare professionals the opportunity to customise practices and procedures in order to fit the local circumstances. Hospitals do rarely ignore or challenge safety requirements, only when they perceive ample room to manoeuvre and safety requirements are either seen as irrelevant or very unpractical. The strategic choices hospitals make seem not only dependent on the experienced room to manoeuvre, but also on the motivation and individual agency of the dominant coalition. Hospitals that take their own initiative in formulating and reshaping their safety management approach are often those that experience leeway and in which members of the dominant coalition play a proactive role in prioritising patient safety. The occurrence of safety incidents or near misses can be an important trigger for this strategic response.

These strategic responses do, in turn, stimulate the adoption of either a control- or a commitment-based management approach. The dominant coalition tends to prefer a control-based approach when they experience little room to manoeuvre and expect

healthcare professionals to lack intrinsic motivation. Thus, if hospitals face concrete and practicable safety requirements that lack clinical relevance, but that are accompanied by tight supervision and serious consequences if requisites are not met, direct supervisors frequently monitor and control healthcare professional behaviours. In contrast, the adoption of a commitment-based management approach is generally chosen if the dominant coalition expects safety requirements to generate intrinsic motivation in healthcare professionals or when they experience plenty of room to manoeuvre. Hence, if hospitals experience clinically relevant safety requirements or abstract requisites that are difficult to put into concrete and controllable regulations or that require the specific expertise of healthcare professionals to transform them into practicable safety procedures, supervisors mostly focus on raising awareness of safety risks, explaining the relevance of safety practices and stimulating participation of healthcare professionals. Notwithstanding this dichotomy, following the wide variety of environmental conditions as well as internal issues of strategic choice that organisations face, all studied hospitals simultaneously or alternately apply elements of both management approaches in order to ensure patient safety.

By analogy to the contextually-based HR theory (Paauwe & Farndale, 2017; Paauwe, 2004), we established a framework for shaping safety management in healthcare (see Figure 2). In this sector, medical specialists have a prominent role in shaping safety management, alongside managers and other staff. Despite the fact that managers' sphere of influence has been extended over the last years, healthcare professionals still remain highly influential when it comes to their clinical work and when their specific expertise is essential for shaping effective practices and procedures (Noordegraaf & Steijn, 2013). Ensuring patient safety has, thus, become a shared responsibility of general managers and healthcare professionals. Secondly, our findings add to the original framework that, in case of patient safety, incidents or near-misses frequently lead to ad-hoc modifications in safety policies and procedures. In HR management, critical incidents and organisational scandals have been found to affect the administrative heritage and accordingly influence the shaping of HRM practices and procedures (Farndale, Paauwe, Boselie, 2010). Yet, in case of patient safety, incidents typically induce short-term learning processes in which organisations investigate what happened and make changes in care processes or safety management in order to reduce the probability of recurrence of similar events. As a consequence, safety incidents or near-misses are important triggers for (re)shaping safety management on short notice. Finally, several feedback loops between the environmental conditions and the strategic choices of the dominant coalition are to be expected. Poor safety outcomes may, for example, not only lead to ad-hoc modifications in safety management but also give rise to new rules and regulations established by medical professional associations (e.g., de Vries et al., 2010; Haynes et al., 2009). Furthermore, strategic responses of the dominant coalition may also provoke reactions of external stakeholders.

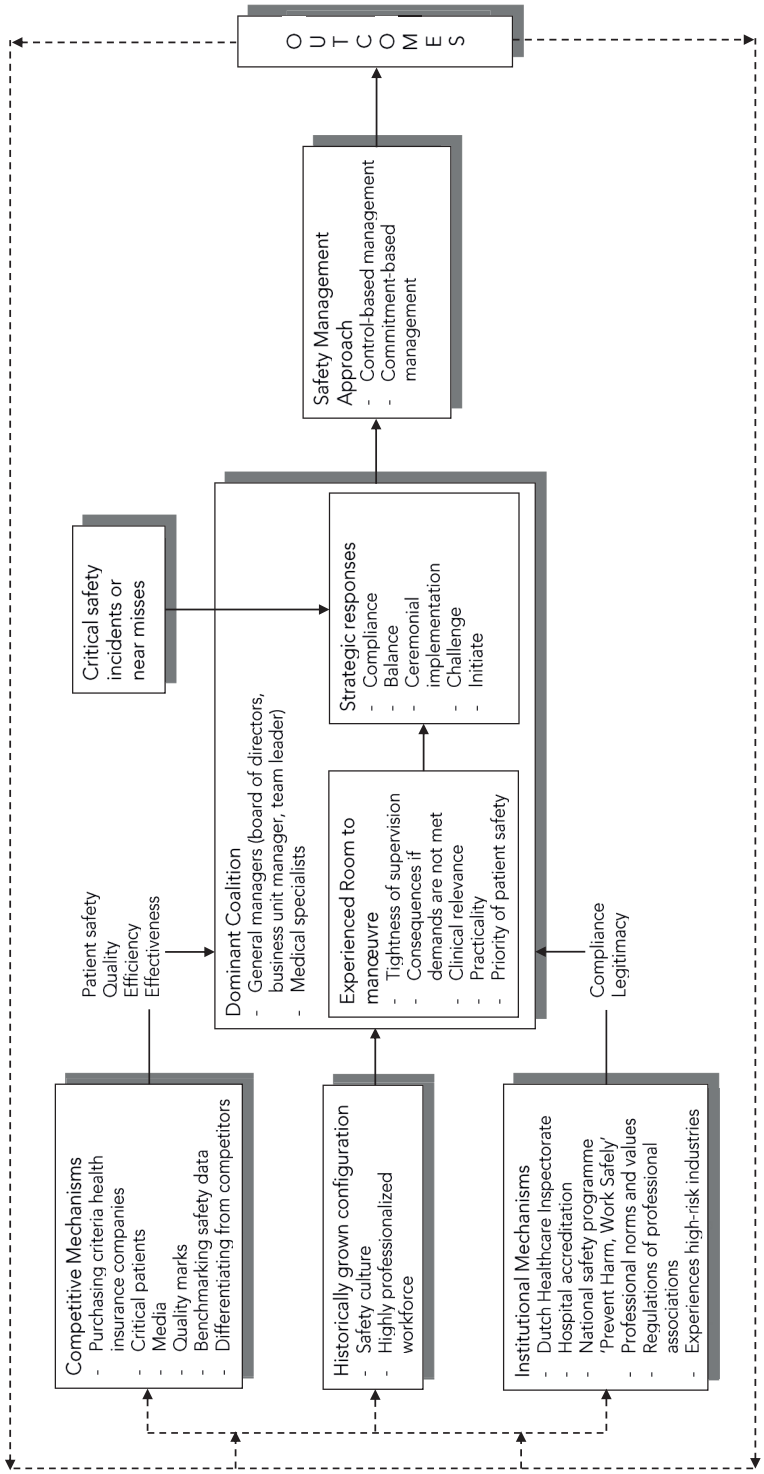

Figure 2 Framework for contextually based safety management in healthcare

If the dominant coalition chooses to challenge or ignore external safety requirements, stakeholders may tighten their supervision or broaden consequences when demands are not met.

The institutional and competitive conditions presented in this study show that, in order to ensure safe care delivery, external stakeholders often impose detailed safety requirements, strong forces for compliance and growing demands for accountability. These external regulations have focused hospitals' attention on patient safety and they have led to intensified efforts to reduce safety incidents. However, strict safety requirements may also have disadvantages. A strong focus on externally regulated compliance and transparency generates extrinsic motivation in employees but it may, at the same time, undermine or even diminish intrinsic motivation to work on patient safety (Gagné & Deci, 2005). This is further reinforced by the control-based management approach that is generally preferred if hospitals face great pressures from external stakeholders. A control-based approach does strengthen employees' extrinsic motivation by providing directions and punishing or rewarding employee behaviours (Merchant & Van der Stede, 2007). It is however contradictory to management control systems that are traditionally used in professional organisations, which are typically based on the intrinsic motivation and professional autonomy of healthcare professionals (Freidson, 2001). Furthermore, emphasis on compliance seems to lead to situations in which some hospitals become primarily concerned with conformity to external safety requirements, rather than proactively dealing with safety risks that are important to the organisation (Hudson, 2001). As a consequence, external regulations may help to keep healthcare safe, but they may also impede progress beyond a certain level (Berwick, 2002); especially in organisations that do prioritise patient safety and that spontaneously strive for excellence. Fostering a proactive safety culture would require a more trust-based control system and ample room to manoeuvre (Hudson, 2001). The Dutch Healthcare Inspectorate and health insurers have recently launched initiatives along these lines. They started introducing systems of so-called 'horizontal inspection' in which organisations are granted exemption from tight supervision after they have proven that self-regulation ensures adequate (safety) performances (e.g., Stoopendaal & Van de Bovenkamp, 2015; Wijnker & Kok, 2015). Thus, external stakeholders have made some first attempts to rely more on trust rather than tight controls, which may, in turn, reinforce the adoption of a commitment-based safety management approach, increase intrinsic motivation in healthcare professionals and stimulate hospitals to proactively deal with safety risks.

This study has some limitations that support the need for future research. First, only respondents in managerial positions or with a leading role in safety management within hospital organisations were interviewed. The focus on intra-organisational actors is consistent with the explorative nature of this study and our aim to gain insight into how organisations shape their safety management approach. However, in future research, it

may be interesting to include external stakeholders that impose safety requirements on hospitals. This may help to gain broader insight into the institutional and competitive mechanisms that influence hospitals' safety management approach by identifying conditions that are overlooked by intra-organisational actors (e.g., horizontal inspection) and it may help to develop understanding of reciprocity between organisational responses and conditions in the wider hospital environment (*i.e.*, feedback loops in our model). Second, the study exclusively focused on hospitals in the Netherlands. Therefore, the generalizability to other healthcare-contexts or other countries may be low. However, Dutch hospitals can also be considered an interesting case because they are subject to safety demands from a diverse set of stakeholders in the institutional and competitive environment (Van de Bovenkamp et al., 2014), and they managed to achieve a considerable reduction in preventable deaths over the previous few years (Baines, Langelaan, de Bruijne, Spreeuwenberg, & Wagner, 2015). Future research may examine which (combination of) management approach(es) contributes to the achievement of this result and, more in general, what the effects of control- and commitment-based management are on patient safety.

CONCLUSIONS

In conclusion, patient safety management requires a balanced approach in which hospitals are encouraged to combine both control- and commitment-based management practices. Institutional and competitive pressures as well as strategic choices that hospitals make, result in various combinations of the safety management approaches. The dominant coalition tends to prefer a control-based approach when they experience little room to manoeuvre and when they expect healthcare professionals to lack intrinsic motivation. The adoption of a commitment-based management approach is generally chosen if the dominant coalition expects safety requirements to generate intrinsic motivation in healthcare professionals or when they experience plenty of room to manoeuvre. External pressures mainly steer managers towards a control-based safety management approach, which generates extrinsic motivation in employees but may, at the same time, undermine or even diminish intrinsic motivation to work on patient safety. Hence, external stakeholders should balance strong forces for compliance with more trust-based safety demands, consequently giving rise to both control- and commitment-based safety management approaches.

Chapter 4

The ConCom Safety Management Scale: Developing and testing a measurement instrument for control- and commitment-based safety management approaches in hospitals

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ABSTRACT

Background: Nursing management is considered important for patient safety. Prior research has predominantly focused on charismatic leadership styles, although it is questionable whether these best characterise the role of nurse managers. Managerial control is also relevant. Therefore, we aimed to develop and test a measurement instrument for control- and commitment-based safety management of nurse managers in clinical hospital departments.

Methods: A cross-sectional survey design was used to test the newly developed questionnaire in a sample of 2,378 nurses working in clinical departments. The nurses were asked about their perceptions of the leadership behaviour and management practices of their direct supervisors. Psychometric properties were evaluated using confirmatory factor analysis and reliability estimates.

Results: The final 33-item questionnaire showed acceptable goodness-of-fit indices and internal consistency (Cronbach's α of the subscales ranges 0.59-0.90). The factor structure revealed three sub-dimensions for control-based safety management: (1) stressing the importance of safety rules and regulations; (2) monitoring compliance; and (3) providing employees with feedback. Commitment-based management consisted of four sub-dimensions: (1) showing role modelling behaviour; (2) creating safety awareness; (3) showing safety commitment; and (4) encouraging participation. Construct validity of the scale was supported by high factor loadings and provided preliminary evidence that control- and commitment-based safety management are two distinct yet related constructs. The findings were reconfirmed in a cross-validation procedure.

Conclusion: The results provide initial support for the construct validity and reliability of our ConCom Safety Management Scale. Both management approaches were found to be relevant for managing patient safety in clinical hospital departments. The scale can be used to deepen our understanding of the influence of patient safety management on healthcare professionals' safety behaviour as well as patient safety outcomes.

INTRODUCTION

Nurse safety leadership is considered an important factor in improving and ensuring patient safety in hospitals (Agnew, Flin, & Reid, 2012). Nurses have a pivotal role in patient safety because of their proximity to patients which enables the early detection of errors and the prevention of adverse events (Institute of Medicine, 2004). Nurse managers may, in turn, provide guidance on safety issues related to nursing care delivery. In this context, at an executive level, managers have a central role in inspiring excellence and giving directions through their participation in policy-making (Ó Lúanaigh & Hughes, 2016; Wong, 2015). At an operational level, nurse managers may engage their nursing staff in safety behaviours by showing role modelling behaviour or stressing the importance of safety regulations (Alingh, van Wijngaarden, Paauwe, & Huijsman, 2015). Nurse safety management is found to be associated with fostering a climate for safety (Leroy et al., 2012; Merrill, 2015), inspiring safety behaviours (Lievens & Vlerick, 2014; Wong, Spence Laschinger, & Cummings, 2010) and improving patient safety outcomes (Wong, Cummings, & Ducharme, 2013).

To ensure that organisational (safety) goals are met, managers employ a wide array of leadership behaviours and management practices (Verschueren, Kips, & Euwema, 2013). So far, studies on patient safety and nursing management have primarily focused on relationship-oriented or trust-based leadership styles (Wong, 2015); particularly transformational styles characterised by showing commitment, inspiring followers and engaging employees in patient safety. However, research has shown that regulating work processes and monitoring safety behaviours form important aspects of managing patient safety as well (Alingh et al., 2015). These more formalised management practices seem to be particularly valuable in the context of lower level managers because direct supervisors try to inspire their followers to comply with safety rules and monitor and control employees' behaviour (Flin & Yule, 2004). Furthermore, it can be questioned whether charismatic and inspirational leadership styles, such as transformational leadership, best characterise the leadership role of nurse managers at an operational level. As Hutchinson & Jackson (2013, p. 18) stated: "*It is increasingly evident that leadership occurs at all levels of an organization, reducing the importance of traditional charismatic, heroic and strategic interpretations of leader-led behaviour*". In line with this, nurse managers act more like a *'primus inter pares'* rather than the traditional charismatic leader, as they frequently have a nursing background themselves and often work in close collaboration with their followers. Moreover, according to some scholars, *"there is a pressing need for much stronger conceptualizations of leadership that clearly define leadership practices"* (Wong et al., 2013, p. 719). These findings inspired us to look for other conceptualisations of safety management and to focus more on concrete management practices and leadership behaviours.

In human resource management (HRM) literature, a distinction is made between two management approaches: control- and commitment-based management (Arthur, 1994; Walton, 1985). A management approach encompasses both the personality and behaviour of the leader as well as the broader spectrum of management practices and devices used to ensure that employees show appropriate behaviours. Control-based management is a formalised, top-down approach that focuses on regulating, monitoring and controlling employees' behaviour, whereas commitment-based management is characterised by creating awareness and facilitating an internalisation of an organisation's mission, vision and goals to ensure that employees show appropriate behaviour (Khatri, Baveja, Boren, & Mammo, 2006; Walton, 1985). These management approaches resemble transactional and transformational leadership, but their focus is somewhat different. Central to a transactional leadership style is the exchange process between a leader and his/her followers, in which the leader clarifies performance criteria and the rewards that employees will receive when they meet the expectations (Northouse, 2013). The basis of a control-based management approach is, in contrast, provided by safety rules and regulations which give direction to appropriate safety behaviours. Transformational leadership is characterised by leaders who hold strong moral values, are charismatic and inspire their followers. This style is criticised for treating *"leadership as a personality trait or personal predisposition rather than a behaviour that people can learn"* (Northouse, 2013, p. 202). Commitment-based safety management presumes, in contrast, that every leader can create an intrinsic motivation in employees. This management approach focuses more on concrete management practices and leadership behaviours that every leader can exhibit rather than personal characteristics that are reserved for a few. Therefore, we expect the concepts of control- and commitment-based safety management to be relevant for lower level management as well. Initial support for the relevance of control- and commitment-based safety management was found in a qualitative study in five hospitals, which showed that hospitals often use a combination of both approaches depending on the safety issues at hand and the specific contextual features (Alingh et al., 2015). Whether hospital managers emphasise a control- or commitment-based management approach depends, for example, on the urgency of safety matters, external pressure and consequences when safety requirements are not met, as well as managers' expectations of the intrinsic motivation of healthcare professionals for certain safety behaviours.

The findings from our qualitative study formed the basis for developing a questionnaire for control- and commitment-based safety management of nurse managers in hospital care (Alingh et al., 2015). The newly developed questionnaire distinguishes itself from existing questionnaires in that it combines control- and commitment-based management approaches, is specifically targeted at patient safety management in hospitals and focuses on concrete management practices and leader behaviours of direct supervisors at an operational level. The current study describes the development and testing of

psychometric properties of the ConCom Safety Management Scale in a sample of nurses working in clinical hospital departments.

BACKGROUND

The basic principle underlying a control-based safety management approach is that workers lack the intrinsic motivation to naturally follow required practices or procedures (Khatri, Halbesleben, Petroski, & Meyer, 2007); hence, exercising control and strengthening extrinsic motivation in employees are considered crucial. Therefore, a control-based safety management approach is first characterised by enforcing compliance with specified rules and procedures (Arthur, 1994; Walton, 1985). In hospitals, a wide range of detailed clinical guidelines, protocols and checklists are used to ensure safe care delivery. The vast majority of these safety regulations are established by professional associations of medical specialists, paramedics or nurses (Noordegraaf & Steijn, 2013). Nurse managers stress the importance of compliance with the rules and procedures and increasingly use them as a tool for managerial control (Alingh et al., 2015). In fact, safety regulations structure work processes and increase predictability, thereby enabling managers to check whether healthcare professionals adequately follow safety rules and procedures. Accordingly, control-based safety management is also characterised by actively monitoring employee behaviour (Khatri et al., 2006; Walton, 1985). Nurse managers observe employee behaviours and monitor compliance during audits and based on registrations in (electronic) patient records (Alingh et al., 2015). Based on these monitoring results, employees are provided with feedback on their compliance with safety regulations (Khatri et al., 2006; Walton, 1985). In the case of recurrent non-compliance, hospitals have established formal sanction policies targeted at specific safety issues. Healthcare professionals who repeatedly ignore the rules and procedures face warnings from their direct supervisors, reprimands from the board of directors and are, ultimately, dismissed or fired (Alingh et al., 2015).

In contrast, commitment-based safety management is a management approach that focuses on facilitating an internalisation of safety norms and values (Arthur, 1994; Khatri et al., 2006). The philosophy of this approach is that fully committed and intrinsically motivated employees are capable of self-discipline, willing to assume responsibility and will deliver better performances (Walton, 1985). Therefore, the approach is first characterised by leaders who give priority to delivering safe care and who clearly communicate their vision to employees, for example, by demonstrating that patient safety is highly valued and prioritised over other organisational aspects such as production. Second, the importance of patient safety is emphasised by nurse managers who show commitment to safety issues, coach workers in safety behaviours and take improvement initiatives

(Alingh et al., 2015). Hence, patient safety is recurrently brought to employees' attention, and employees are also given practical advice on desired safety behaviours. Furthermore, direct supervisors show role modelling behaviour, which is considered crucial in ensuring their credibility. If role models practise what they preach, they may encourage healthcare professionals to imitate desired behaviours (Simons, Leroy, Collewaert, & Masschelein, 2015). Fourth, managers encourage employees to participate in managerial decision-making and to demonstrate initiative (Arthur, 1994; Walton, 1985). They actively invite employees to make safety recommendations, to question the feasibility of safety initiatives and to apply their medical expertise to safety matters (Alingh et al., 2015). By doing so, managers sharpen employees' sense of personal responsibility and their shared ownership for patient safety (Hughes, Chang, & Mark, 2009). Finally, nurse managers attempt to increase consciousness of safety issues by making employees aware of potential safety risks and deficiencies in their own performance (Alingh et al., 2015; Walton, 1985). Healthcare professionals usually bear great responsibility for delivering safe care but are frequently not aware of safety risks that care delivery entails. Therefore, nurse managers may increase this awareness by discussing safety incidents, providing insight into patient outcome measures and comparing data with similar units in other hospitals.

In HRM literature, it is generally assumed that organisations primarily rely on either control- or commitment-based management (Arthur, 1994; Walton, 1985). However, in the case of patient safety management, both management approaches seem to be complementary rather than mutually exclusive (Alingh et al., 2015). Developing a measurement instrument for control- and commitment-based safety management may help to gain further insight into the use of both management approaches.

METHODS

Measurement instrument development

The above described conceptualisations of control- and commitment-based safety management (see also definitions in Table 1) formed the basis for developing the ConCom Safety Management Scale. A set of three to six survey items per sub-dimension was developed, addressing nurses' perceptions of the management practices and leadership behaviours shown by their nurse managers (Hinkin, 1995). When available, statements were derived from previously published scales. First, items of two frequently used questionnaires to assess a safety culture – the Safety Attitudes Questionnaire (Sexton et al., 2006) and the Dutch version of the Hospital Survey on Patient Safety Culture (Smits, Christiaans-Dingelhoff, Wagner, van der Wal, & Groenewegen, 2008) – were screened for statements that correspond with our conceptualisation of both management approaches. To measure formalisation, the climate for formalisation scale was used (Cronbach's α=0.77)

(Patterson et al., 2005). The nurse managers' commitment to patient safety was measured using a selection of items of the transformational leadership questionnaire (Multifactor Leadership Questionnaire 5), which are adapted to specifically fit patient safety management (Avolio & Bass, 2004). To assess the nurse managers' role modelling behaviour, we used the Behavioural Integrity Scale (α=0.93) (Leroy et al., 2012). Finally, based on insights derived from our qualitative study on control- and commitment-based safety management 12 additional items were formulated by the research team (Alingh et al., 2015).

The content validity of the instrument was assessed by the authors, who individually reviewed draft versions of the questionnaire (DeVellis, 2012). The authors assessed the relevance of formulated items in relation to the conceptualisations of the sub-dimensions of both safety management approaches and offered suggestions for elements that were not yet sufficiently captured in the questionnaire. Differences of opinion between the authors were discussed in the research team till consensus was reached and all authors agreed that the questionnaire accurately reflects the conceptualisation of control- and commitment-based safety management. Furthermore, face validity of the initial set of items was assessed by a group of nine practitioners thoroughly familiar with safety management in hospitals (including patient safety officers, nurse managers and project leaders involved in safety improvement projects). Finally, three nurses were interviewed to check the wording and comprehension of items, resulting in some suggestions for rephrasing. The final set of items presented to participants in this study consisted of 37 statements, using a 4-point or 5-point Likert scale plus the option 'I don't know' (see Table 1). Items derived from previously published scales were answered using their original response scale. Scale scores were recalculated on a 20-point scale: answers on a 4-point Likert scale were multiplied by 5, answers on a 5-point Likert scale by 4.

Table 1 Sub-scale definitions and descriptive statistics per item (n=2,627)

	Item statements	Mean	SD	Minimum	Maximum	% 'I don't know' answers
Control-based safety management						
Formalisation: A supervisor stresses the importance of compliance with safety rules and regulations						
1	In this department, it is considered extremely important to follow safety rules and procedures (e.g., regarding hand hygiene) [1a]	3.35	0.563	1	4	0.2
2	In this department, people can ignore formal safety rules and procedures if it helps to get the job done [1a]*	2.91	0.712	1	4	3.1
3	In this department, everything has to be done by the book [1a]	2.83	0.590	1	4	1.1
4	In this department, it is not necessary to follow safety rules and procedures to the letter [1a]*	3.26	0.705	1	4	1.0

Table 1 Sub-scale definitions and descriptive statistics per item (n=2,627) (continued)

	Item statements	Mean	SD	Minimum	Maximum	% 'I don't know' answers
5	In this department, nobody gets too upset if people break safety rules and procedures [1a]*	3.26	0.618	1	4	2.1
	Monitor compliance: *A supervisor monitors compliance with safety rules and regulations during care delivery and audits, as well as based on registrations in (electronic) patient records*					
6	When my supervisor is in the department, he/she monitors whether we comply with safety rules and procedures (e.g., regarding hand hygiene) [6b]	3.22	0.966	1	5	4.0
7	Whether we comply with safety rules is monitored based on information registered in (electronic) patient records (e.g., information regarding pressure ulcers, pain, frail elderly) [6b]	3.72	0.841	1	5	2.9
8	In this department, it is rarely monitored whether employees comply with safety rules and procedures [6b]*	3.57	0.858	1	5	1.9
9	In this department, employees' compliance with safety rules and procedures is monitored on a regular basis, for example during safety audits or walk rounds [6b]	3.73	0.866	1	5	2.1
	Provide feedback on (non-) compliance: A supervisor provides employees with either positive or negative feedback on their compliance with safety rules and regulations and uses formal sanction policies in case of recurrent non-compliance					
10	My supervisor says a good word when he/she sees a job done according to established patient safety procedures [2c]	3.42	1.021	1	5	1.1
11	In my department, anyone who violates safety rules or procedures is swiftly corrected [6c]	3.30	0.860	1	5	2.7
12	When we repeatedly do not comply with safety rules or procedures, disciplinary actions will be taken [6c]	3.21	0.882	1	5	9.5
13	Compliance with safety rules and procedures (e.g., regarding hand hygiene) does substantially contribute to a positive assessment in our department [6c]	3.44	0.875	1	5	2.8
	Commitment-based safety management					
	Prioritise patient safety: A supervisor gives priority to delivering safe care and demonstrates this to employees, both in words and deeds					
14	My supervisor overlooks patient safety problems that happen over and over [2c]*	3.90	0.858	1	5	2.2
15	Whenever pressure builds up, my supervisor wants us to work faster, even if it means taking shortcuts [2c]*	3.60	0.977	1	5	1.2
16	The actions of my supervisor show that patient safety is a top priority [2c]	3.45	0.911	1	5	4.3

Table 1 Sub-scale definitions and descriptive statistics per item (n=2,627) (continued)

	Item statements	Mean	SD	Minimum	Maximum	% 'I don't know' answers
	Show commitment on patient safety: A supervisor shows determination to ensure patient safety by encouraging employees to deliver safe care to patients, coaching workers in safety behaviours and taking improvement initiatives					
17	My supervisor provides continuous encouragement to do our jobs safely [3b]	3.85	0.942	1	5	1.2
18	My supervisor shows determination to maintain a work environment where we deliver safe care to our patients [3b]	4.05	0.858	1	5	1.4
19	My supervisor behaves in a way that displays a commitment to patient safety [3b]	3.98	0.870	1	5	1.4
20	My supervisor suggests new ways of doing our jobs more safely [3b]	3.28	1.033	1	5	2.4
21	My supervisor spends time showing me the safest way to do things at work [3b]	2.95	1.210	1	5	3.4
	Show role modelling behaviour: A supervisor is a role model for employees in regard to patient safety and practises what he/she preaches					
22	Regarding safety, my supervisor delivers the consequences he/she describes [4c]	3.75	0.830	1	5	2.8
23	When my supervisor lays out safety protocols, he/she makes sure people follow it [4c]	3.67	0.788	1	5	2.9
24	My supervisor enforces the safety protocols he/she describes [4c]	3.53	0.806	1	5	3.8
25	My supervisor always practises the safety protocols he/she preaches [4c]	3.58	0.791	1	5	13.2
26	My supervisor does not actually prioritise safety issues as highly as he/she says he/she does [4c]*	3.99	0.860	1	5	2.7
27	Regarding safety, my supervisor's words do not match his/her deeds [4c]*	3.73	0.925	1	5	2.6
	Encourage participation: A supervisor encourages employees to take initiative on improving patient safety and to participate in decision-making processes on safety issues					
28	My supervisor seriously considers staff suggestions for improving patient safety [2c]	3.87	0.851	1	5	1.1
29	In this department, staff is involved in decision-making processes [5c]	3.20	0.950	1	5	0.5
30	My supervisor encourages me to express my ideas and suggestions regarding patient safety improvement [6c]	3.93	0.836	1	5	0.8
31	My supervisor encourages us to take initiative on improving patient safety whenever it is possible [6c]	3.89	0.806	1	5	1.4

Table 1 Sub-scale definitions and descriptive statistics per item (n=2,627) (continued)

	Item statements	Mean	SD	Minimum	Maximum	% 'I don't know' answers
Create safety awareness: A supervisor attempts to increase consciousness of safety issues by making employees aware of the potential safety risks and deficiencies in their own performance						
32	We are informed about errors that happen in this department [2b]	3.86	0.878	1	5	0.5
33	We are given feedback about changes put into place based on event reports [2b]	3.97	0.964	1	5	0.4
34	In this department, we discuss ways to prevent errors from happening again [2b]	3.94	0.883	1	5	0.3
35	We are generally informed about the patient outcomes available for our department [6b]	3.85	1.003	1	5	4.0
36	In this department, performance indicators for patient safety (e.g., pressure ulcers, hospital acquired infections) are discussed [6b]	3.85	1.074	1	5	4.4
37	We compare our patient outcomes with results of other departments, and results of this benchmark are discussed [6b]	3.40	1.186	1	5	15.4

[1]Climate for formalisation scale; [2] items from the Dutch Hospital Survey on Patient Safety Culture; [3] items adapted from the Multifactor Leadership Questionnaire-5; [4] Behavioural Integrity Scale; [5] items derived from the Safety Attitudes Questionnaire; [6] items formulated by the research team (Avolio & Bass, 2004; Leroy et al., 2012; Patterson et al., 2005; Sexton et al., 2006; Smits et al., 2008).
[a] 4-point Likert scale ranging from 'definitely false' to 'definitely true'; [b] 5-point Likert scale ranging from 'never' to 'always'; [c] 5-point Likert scale ranging from 'completely disagree' to 'completely agree'.
* Reverse scored items.

Sample and data collection

A cross-sectional survey design was used to test the psychometric properties of the instrument. Via hospital associations, all of the Dutch hospitals were invited to participate, resulting in a sample of 15 general hospitals and 2 university medical centres (respectively 20% and 25% of all hospitals in the Netherlands) (Dutch Hospitals Association, 2015). Within each hospital, nurses working in clinical departments (i.e., medical wards, surgical wards, day care units and intensive care units) were approached to participate. All of these nurses hold a staff position; they provided direct patient care and were not directly involved in managerial tasks within their department. Between September 2014 and May 2015, a total of 11,809 nurses were invited to complete a questionnaire, yielding a sample size that well exceeds the minimum number required for scale development (Nunnally, 1978). The total number of nurses that were approached to participate may be somewhat overestimated because in six hospitals we were unable to differentiate between occupational groups and, therefore, counted all of the healthcare professionals

who received a questionnaire rather than only the nurses. Potential participants received a letter or email with a link to the online questionnaire and were informed about the study purpose and asked to participate anonymously. Nurse managers were asked to further inform their nursing staff about the study and to encourage their employees to complete the questionnaire. Two reminders were sent to non-responders after two and four weeks. No incentives in the form of money or gifts were offered.

Only fully completed questionnaires were included in the analysis, resulting in a sample of 2,627 surveys (response rate 22%). We were unable to conduct a non-response analysis because we did not have insight into the relevant characteristics of all of the nurses invited to complete a questionnaire. The characteristics of nurses in our sample do, however, resemble the characteristics of the nursing workforce in all Dutch hospitals (CBS StatLine, 2016). Correspondence with non-responders and contact persons within the hospitals identified various reasons for non-response: too busy, not working at a clinical department anymore or fatigued by over-surveying. Furthermore, in two hospitals the online survey programme was blocked at some of the computers, which might have reduced possibilities for participation in the study.

The Ethics Review Board confirmed that our study was outside the scope of the Netherlands' Medical Research Involving Human Subjects Act and that the rights and privacy of study participants have been taken into account sufficiently (Administration number: EC-2017.62). Passive consent was obtained from all participants as they voluntary agreed to complete the questionnaire and were free to quit at any time during the research.

Statistical analysis of the measurement model

First, the descriptive statistics for each item were examined, including item means, standard deviations and inter-item correlations. If respondents answered less than 10% of the items with 'I don't know', these items were imputed using the multiple imputation procedure in SPSS V23.0. Respondents who answered more than 10% of the items with 'I don't know' were excluded from the analyses. This led to a final sample of 2,378 nurses (91% of the completed surveys). To test the psychometric properties of the instrument, the final sample was randomly divided into two subsamples: one sample (N=1,165) was used to test and revise our initial structural model; the second sample (N=1,213) was used in a cross-validation procedure.

Subsequently, confirmatory factor analysis (CFA) with structural equation modelling was conducted to analyse the relationships between the observed variables and latent constructs underlying the measurement instrument (Brown, 2014). The analyses were based on the sample variance-covariance matrix using a maximum likelihood estimation method and carried out in Lisrel V8.80. No double-loading indicators or correlated measurement errors were allowed in the model. We first tested our initial, theoretical model consisting of eight latent factors (i.e., the sub-dimensions described in Table 1) and two

second-order constructs (i.e., control- and commitment-based safety management). The model's goodness-of-fit was evaluated using the likelihood ratio chi-square (χ^2), root means square error of approximation (RMSEA) and its 90% confidence interval, comparative fit index (CFI), Tucker-Lewis index (TLI) and standardised root mean square residual (SRMR). The cut-off criteria for the different fit indices were based on suggestions of Hu and Bentler (1999). A well-fitting model would provide a non-significant χ^2 value; however, χ^2 is highly sensitive to sample size, and therefore it is difficult to obtain non-significant values in large samples (Hooper, Coughlan, & Mullen, 2008). Furthermore, RMSEA $\leq$0.06 indicates acceptable fit; for both CFI and TLI – which are relatively independent of sample size (Fan, Thompson, & Wang, 1999) – the cut-off values of $\geq$0.95 are recommended; and finally for SRMR, values $\leq$0.08 are generally deemed acceptable (Hu & Bentler, 1999).

After testing our initial, theoretical model, we used a stepwise CFA approach to successively analyse and optimise the measurement models of each proposed sub-dimension as well as the two different safety management approaches. During an iterative process, modifications to the model were respectively guided by factor loadings, modification indices, internal consistency of each subscale (Cronbach's α), descriptive statistics of the items and conceptual arguments; all modifications were discussed by the research team and had to be theoretically plausible. Revisions continued until no more indications for improvement were found or further modifications were not theoretically plausible. We also compared the proposed model with two second-order constructs for control- and commitment-based safety management and a model with only one second-order construct (i.e., one single safety management approach). All of the models were compared using a χ^2 difference test ($\Delta\chi^2$) in which $p<0.05$ was deemed significant. During a cross-validation procedure, our final model was retested in the second sample of 1,213 respondents. Finally, the correlations and reliability estimates were analysed to assess internal consistency of (the sub-dimensions of) our final model. Furthermore, one-way ANOVA was conducted in SPSS and intra-class correlation coefficients (ICC) were calculated to further test whether the instrument has the ability to detect variation in safety management approaches across hospitals and clinical departments. One-way ANOVA and ICC values were calculated based on the data of departments with a minimum response of eight nurses. This cut-off value reflects 20% of the median number of nurses who were invited to complete a questionnaire per department (i.e., 20% of an average of 40 invited nurses per department) and was used because we were unable to calculate a response rate per department.

RESULTS

Table 2 provides an overview of the sample characteristics of the 2,627 nurses who completed the questionnaire. The vast majority of respondents were registered nurses (95.6%), mostly female (84.7%), on average 40.2 years of age and had 10 years work experience in their clinical department. The nurses were affiliated to 269 different departments. Per department, an average of 10 nurses (SD: 6) completed the questionnaire. Almost all of the respondents (N=2,476, 95.3%) mentioned a nurse manager as their main supervisor.

Table 2 Sample characteristics (n=2,627)

Characteristics		
Age	*Mean (range)*	*SD*
Age in years (n=2,450)	40.2 (18 – 65)	11.6
Gender	*N*	*%*
Male	320	12.2
Female	2,225	84.7
Missing	82	3.1
Job position	*N*	*%*
Registered nurse	2,512	95.6
Student nurse	63	2.4
Nurse practitioner	52	2.0
Years of experience	*Mean (range)*	*SD*
In the organisation (n=2,540)	14.2 (0 – 46)	10.3
In the clinical department (n=2,506)	10.0 (0 – 45)	8.5
Average workweek	*N*	*%*
< 20 hours	188	7.2
20 – 39 hours	2,369	90.2
> 40 hours	24	0.8
Missing	46	1.8

Descriptive statistics (see Table 1) show that most of the items had relatively high mean scores, although none of the items had poor discriminative abilities (i.e., >75% of respondents gave the same score; a cut-off value that is even more strict than the often used cut-off value of 95%) (Clark & Watson, 1995). Furthermore, some items had a relatively high number of 'I don't know' answers, especially items 25 and 37 (13% and 15%, respectively). Assessment of inter-item correlations revealed some items with relatively low (<0.30) inter-item correlations, particularly within control-based safety management subscales. These findings were taken into account during the stepwise CFA procedure.

Our initial, theoretical model showed acceptable goodness-of-fit indices (see Table 3), although, as expected based on the sample size, a significant χ^2 value was found ($p<0.001$). The modification indices, factor loadings and reliability estimates provided some indications that the model could be improved. During a stepwise CFA approach, items 24, 23, 29 and 10 (see Table 1) were eliminated successively due to high modification indices and their negative impact on the reliability estimates. Furthermore, the subscales 'Prioritise patient safety' and 'Show role modelling behaviour' were highly correlated ($r=0.998$) and high modification indices were found for items within these subscales. Therefore, we combined both subscales into one factor. Combining the subscales sounds theoretically plausible because nurse managers should show that they prioritise patient safety both in words and deeds. Hence, the final version of the measurement instrument consisted of 33 items related to seven subscales and two second-order constructs (i.e., control- and commitment-based safety management). Overall, the fit of the revised model (slightly) improved compared with the initial model. The χ^2 value significantly decreased to 2,426 ($\Delta\chi^2(1)=221$, $p<0.001$), the RMSEA was just below the cut-off value of 0.06, the CFI and TLI were well above 0.95, and the SRMR was below the recommended critical value of 0.08. The model with two second-order constructs also showed a significantly better fit than a model with one second-order construct ($\Delta\chi^2(133)=1,074$, $p<0.001$), which supports the distinction between control- and commitment-based safety management. The results were reconfirmed in a cross-validation procedure because similar fit indices were found in the second set of data (N=1,213).

Table 3 Goodness-of-fit indices*

	Model†	χ^2	df	RMSEA (90% C.I.)	CFI	TLI	SRMR
Initial model (N=1,165)	2Fa	3500	620	0.063 (0.061 to 0.065)	0.978	0.976	0.064
Revised model (N=1,165)	2Fb	2426	487	0.059 (0.056 to 0.061)	0.981	0.979	0.058
	1Fb	2647	488	0.062 (0.059 to 0.064)	0.979	0.977	0.064
Cross validation (N=1,213)	2Fb	2642	487	0.060 (0.058 to 0.063)	0.979	0.977	0.066

All χ^2 $p<0.001$

CFI, comparative fit index; df, degrees of freedom; RMSEA, root means square error of approximation; SRMR, standardised root mean square residual; TLI, Tucker-Lewis index.

* χ^2 goodness-of-fit statistic: assessment of magnitude of discrepancy between sample and fitted covariance matrices; RMSEA: population based error of approximation index that assesses the extent to which a model fits reasonably well in the population; CFI: reflects the difference between the independence model and the estimated model; TLI: resembles CFI but compensates for the effect of model complexity; SRMR: reflects the difference between residuals of the sample covariance matrix and the hypothesised covariance model (Brown, 2014; Hooper et al., 2008; Hu & Bentler, 1999).

† 2Fa = model with eight latent factors and two second-order constructs (i.e., control- and commitment-based safety management); 2Fb = model with seven latent factors and two second-order constructs (i.e., control- and commitment-based safety management); 1Fb = model with seven latent factors and one second-order construct (i.e., safety management approach).

Table 4 Descriptive statistics and correlations of subscales (revised model)†

	Items (N)	α	Scale mean (SD)‡	Average λ (min-max)	Average inter-item correlation (min-max)	F	ICC(1)	ICC(2)	Correlations						
									1a	1b	1c	2a	2b	2c	2d
1 Control-based safety management		**.79**	**14.38 (1.91)**			**4.478***	**.192**	**.777**	**.759***	**.796***	**.847***	**.522***	**.471***	**.492***	**.419***
1a Stress the importance of safety rules and regulations	5	.70	15.60 (2.14)	.65 (.51-.80)	.32 (.21-.52)	2.902*	.115	.655							
1b Monitor compliance	4	.59	14.29 (2.33)	.56 (.45-.69)	.27 (.16-.43)	4.052*	.172	.753	.408*						
1c Feedback on (non-) compliance	3	.64	13.24 (2.64)	.64 (.55-.73)	.37 (.30-.42)	3.272*	.134	.694	.473*	.511*					
2 Commitment-based safety management		**.94**	**15.04 (2.55)**			**8.278***	**.332**	**.879**	**.421***	**.506***	**.437***	**.882***	**.735***	**.894***	**.859***
2a Role modelling behaviour	7	.90	14.84 (2.82)	.80 (.67-.89)	.56 (.37-.72)	8.072*	.325	.876	.419*	.442*	.401*				
2b Create safety awareness	6	.86	15.26 (3.08)	.76 (.65-.85)	.52 (.37-.68)	5.232*	.224	.809	.356*	.429*	.353*	.483*			
2c Leader's safety commitment	5	.90	14.51 (3.36)	.85 (.77-.94)	.66 (.58-.79)	6.726*	.281	.851	.355*	.443*	.386*	.759*	.523*		
2d Encourage participation	3	.82	15.53 (2.85)	.84 (.84-.85)	.60 (.57-.66)	5.405*	.231	.815	.288*	.388*	.331*	.753*	.459*	.708*	

* $p<0.01$ (2-tailed)

† Reliability estimates, scale means, average λ and correlations were determined based on the data of our second sample (N=1,213). One-way ANOVA and ICC values were calculated based on the data of departments with a minimum response of eight nurses in the complete dataset (N=2,378).

‡ Scale scores were recalculated on a 20-point scale: answers on a 4-point Likert scale were multiplied by 5, answers on a 5-point Likert scale by 4.

Table 4 reports the descriptive statistics and reliability estimates of the subscales in the final model. The factor loadings of all individual items exceeded the critical value of 0.3 as recommended by Field (2013) and the loadings between the first-order and second-order constructs were also high (average λ=0.86, range 0.64–0.96), providing support for the construct validity of our measurement instrument. As expected, all of the sub-dimensions were significantly and positively correlated (ranging from *r*=0.29 to *r*=0.76). Furthermore, a correlation of 0.57 was found between the second-order constructs control- and commitment-based safety management, indicating that both management approaches were strongly related but should be seen as distinct constructs. This finding was further supported by the fact that higher correlations were found between the factors allocated to the same safety management approach compared to correlations across management approaches. Nevertheless, nurses in all departments reported a combination of control- and commitment-based safety management rather than either one of them (see Figure 1). Assessment of the internal consistency showed that the subscales 'Monitor compliance' and 'Provide feedback on (non-) compliance' had relatively low reliability estimates, α is 0.59 and 0.64, respectively. However, deleting items from these subscales did not improve their reliability. The reliability estimates of the other subscales ranged from 0.70 to 0.90, reflecting acceptable to very good internal consistencies (DeVellis, 2012). Results of descriptive statistics and reliability estimates of the subscales were comparable across the two subsamples of the cross-validation procedure.

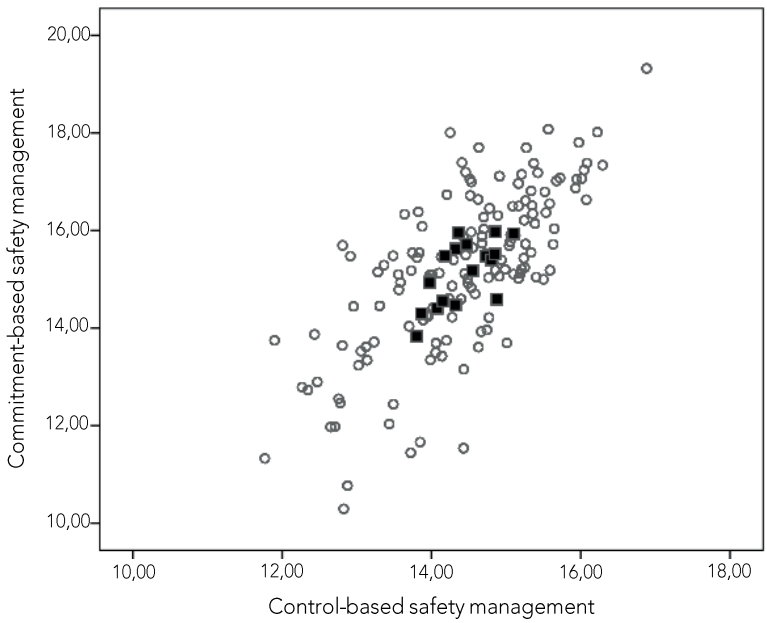

Figure 1 Mean scores of control- and commitment-based safety management
■ hospitals ○ clinical departments (Minimum response of eight nurses)

All of the items in our measurement instrument refer to management practices and leadership behaviours of supervisors at a departmental level (i.e., ward level). Accordingly, one-way analysis of variance (ANOVA) showed that at a departmental level, between-group variance was significantly greater than within-group variance for the sub-dimensions as well as the two management approaches. In addition, ICC(1) signals that 12% to 33% of the individual-level variance could be attributed to the department level. As most of the ICC(2) values well exceeded the minimum value of 0.70, aggregation of individual scores to a department level is justified (Klein & Kozlowski, 2000). The same holds for aggregation to a hospital level (ICC(2) range 0.752–0.911). However, because only 2% to 7% of the individual-level variance can be attributed to this level, aggregation to a hospital level would not be meaningful.

DISCUSSION

This study aimed at developing and testing a questionnaire for perceived control- and commitment-based safety management of nurse managers in clinical hospital departments. The findings supported construct validity and reliability of the ConCom Safety Management Scale. Our final model consists of seven sub-dimensions that were allocated to either control- or commitment-based safety management. Overall, positive and high estimates were found for both item factor loadings and loadings on the two second-order constructs. The reliability coefficients of the management approaches as well as most of the sub-dimensions well exceeded the generally accepted criterion of 0.70 (Nunnally, 1978). Only the subscales 'Monitor compliance' and 'Provide feedback on (non-) compliance' had somewhat lower estimates, but we had no conceptual arguments to remove them. The findings on construct validity and reliability were also consistent across the two subsamples used in this study, providing initial support for scale stability (DeVellis, 2012). In addition, the results provided preliminary evidence that the measurement instrument had the ability to detect variation in the safety management approaches adopted by nurse managers at different departments and to a slightly lesser extent between hospitals. Considerable congruence was found in the scores of nurses working at the same clinical department. The final model strongly resembled our theoretical model. Only the sub-dimensions 'Prioritise patient safety' and 'Show role modelling behaviour' were found to be one rather than two separate factors. Apparently, nurses do not distinguish between the message that managers send by words and by deeds; they seem to seek a pattern of alignment (Simons et al., 2015). Thus, nurse managers who 'walk the talk' may clearly prioritise patient safety and send an unambiguous message to their employees on appropriate safety attitudes and behaviours (Leroy et al., 2012).

The results of this study provide support that control- and commitment-based safety management are two distinct, yet related constructs that are both relevant for managing patient safety. These findings defy a generally accepted idea in HRM literature (e.g., Arthur, 1994; Walton, 1985) that organisations primarily rely on either control- or commitment-based management, and further support the idea that both management approaches are considered complementary rather than mutually exclusive in regard to patient safety management (Alingh et al., 2015). This is further emphasised by descriptive statistics that show that nurses clearly recognise aspects of both management approaches in how their nurse managers steer patient safety. Thus, nurse managers frequently combine elements of control and commitment-based safety management, although considerable variation is found as well. Future research is needed to deepen our understanding of the reasons underlying this variation. Furthermore, our findings stress the need that elements of both management approaches are combined in future research. Safety culture assessment tools do, for example, frequently incorporate aspects of safety management, although items predominantly focus on commitment-based management practices such as safety commitment of senior management, managerial support for patient safety, communication openness, leaders' awareness of safety problems and their reactions to reported safety concerns (e.g., Blegen, Gearhart, O'Brien, Sehgal, & Alldredge, 2009; Ginsburg et al., 2009; Sexton et al., 2006; Singer et al., 2007). Control-based safety management practices are largely overlooked. Our findings make a plea to combine elements of both control- and commitment-based safety management and to shift the focus towards the broader range of management practices and leader behaviours used to optimise patient safety.

The ConCom Safety Management Scale as developed in this study can be used as a tool to evaluate safety management in practice. Future research may, for example, explore how nurses' perceptions of the management approach adopted by their nurse managers influence employees' safety-related attitudes, behaviour and patient safety performance. Such insights may help to open a dialogue among (nurse) managers and nursing staff on how to further improve patient safety management within their department or organisation. Furthermore, when future research provides insight into the effects of different (combinations of) safety management approaches, the instrument may also serve as a starting point to coach individual nurse managers in regard to patient safety management.

The present study has some limitations. First, we exclusively focused on nurses in clinical hospital departments. Replication research is needed for other settings and occupational groups. The latter may require reframing of the items; physicians may, for example, not identify with a direct supervisor. Furthermore, despite our large sample, the response rate was relatively low, raising some questions about representativeness. However, the characteristics of nurses in our sample do resemble the characteristics of the nursing

workforce in all Dutch hospitals (CBS StatLine, 2016). Third, the relatively high number of 'I don't know' answers found for some items in the questionnaire might induce reframing of these statements. Accordingly, variation in the framing of items (i.e., 'my supervisor' versus 'this department') as well as response scales may also be reconsidered to further improve the questionnaire. Fourth, our results provide support for the construct validity of the measurement instrument, but the criterion-related validity has not been tested yet. In other words, the operationalisation of control- and commitment-based safety management used in this study has not been compared with other questionnaires on patient safety management (DeVellis, 2012). Finally, the ConCom Safety Management Scale focuses on nurses' perceptions, not on the actual leader behaviours and management practices of supervisors. These perceptions are considered crucial in understanding the linkage between management approaches and employee behaviours or performances, but perceptions are influenced by variation in actual management practices as well as how individuals interpret and perceive the safety management approach (Nishii, Lepak, & Schneider, 2008).

In conclusion, the current study provides initial support for the ConCom Safety Management Scale as a measurement instrument of control- and commitment-based safety management. The ConCom Safety Management Scale highlights the importance of frequently mentioned safety-related management practices and leadership behaviours, such as showing commitment, role modelling behaviour, creating awareness and encouraging employees to take initiative. However, in the current study, these practices are applied specifically to the realm of patient safety management at a departmental level. Moreover, the questionnaire also stresses the importance of safety rules and procedures, monitoring compliance and providing nurses with feedback. Thus, the conceptualisation used in this study reveals a more complete picture of patient safety management, in line with how nurse managers manage patient safety in clinical hospital departments.

Chapter 5

Speaking up about patient safety concerns: The influence of safety management approaches and climate on nurses' willingness to speak up

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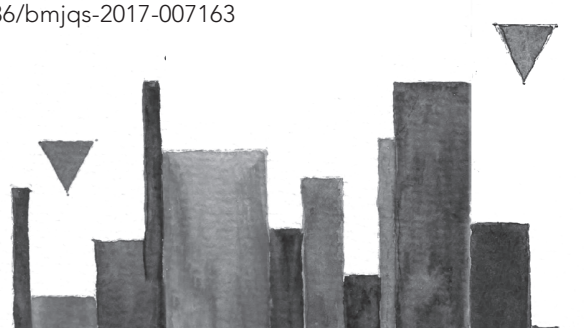


ABSTRACT

Background: Speaking up is important for patient safety, but healthcare professionals often hesitate to voice their concerns. Direct supervisors have an important role in influencing speaking up. However, good insight into the relationship between managers' behaviour and employees' perceptions about whether speaking up is safe and worthwhile is still lacking.

Aim: To explore the relationships between control- and commitment-based safety management, climate for safety, psychological safety and nurses' willingness to speak up.

Methods: We conducted a cross-sectional survey study, resulting in a sample of 980 nurses and 93 nurse managers working in Dutch clinical hospital wards. To test our hypotheses, hierarchical regression analyses (at ward level) and multilevel regression analyses were conducted.

Results: Significantly positive associations were found between nurses' perceptions of control-based safety management and climate for safety (β=0.74; p<0.001), and between the perceived levels of commitment-based management and team psychological safety (β=0.36; p<0.01). Furthermore, team psychological safety is found to be positively related to nurses' speaking up attitudes (B=0.24; t=2.04; p<0.05). The relationship between nurse-rated commitment-based safety management and nurses' willingness to speak up is fully mediated by team psychological safety.

Conclusion: Results provide initial support that nurses who perceive higher levels of commitment-based safety management feel safer to take interpersonal risks and are more willing to speak up about patient safety concerns. Furthermore, nurses' perceptions of control-based safety management are found to be positively related to a climate for safety; although, no association was found with speaking up. Both control-based and commitment-based management approaches seem to be relevant for managing patient safety, but when it comes to encouraging speaking up a commitment-based safety management approach seems to be most valuable.

INTRODUCTION

Speaking up is important for patient safety. Healthcare professionals who question clinical practices that may compromise patient safety and who raise *"concerns […] upon recognising or becoming aware of the risky or deficient actions of others within health care teams"* (Okuyama, Wagner, & Bijnen, 2014, p. 1) can prevent the occurrence of adverse events, improve team performance and facilitate a learning environment (Kolbe et al., 2012; Morrison, 2014; Okuyama et al., 2014). Despite these potential benefits, prior research showed that healthcare professionals often hesitate to speak up and choose to remain silent (Martinez et al., 2017; Maxfield, Grenny, McMillan, Patterson, & Switzler, 2005; Schwappach & Gehring, 2015).

A key factor influencing whether employees dare to speak up is the behaviour of their direct supervisor (Ashford, Sutcliffe, & Christianson, 2009; Morrison, 2011). Supervisors may, for example, stimulate their staff to voice concerns by actively inviting and appreciating staff input, coaching workers, showing authentic leadership and building trustful relationships with their subordinates (Edmondson, 2003; Morrison, 2014; Morrow, Gustavson, & Jones, 2016; Robbins & McAlearney, 2016; Wong, Spence Laschinger, & Cummings, 2010). So far, only a few studies have empirically tested the relationship between leader behaviour and employee voice (e.g., Detert & Burris, 2007; Edmondson, 2003; Wong et al., 2010). Consequently, *"a clear picture of exactly what it is that leaders do or do not that shapes employees' perceptions"* (Morrison, 2011, p. 391) about whether speaking up is safe and worthwhile is still lacking. The concepts of control- and commitment-based safety management may help to shed light on this.

Control- and commitment-based safety management reflect different aspects of how direct supervisors manage patient safety (Khatri, Baveja, Boren, & Mammo, 2006; Walton, 1985). In a control-based safety management approach, managers stress the importance of following safety rules, monitor compliance and provide employees with feedback. In a commitment-based safety management approach, managers clearly prioritise patient safety by exhibiting role modelling behaviour, they show determination to ensuring safe care delivery, encourage employees to participate in safety improvement initiatives and create awareness on safety issues (Alingh, van Wijngaarden, Paauwe, & Huijsman, 2015). Both management approaches could influence how professionals perceive the risks (psychological safety) and priorities (climate for safety) when it concerns safety behaviour. In the following paragraphs we will outline the hypothesised relationships between the safety management approaches, team psychological safety, climate for safety and employees' willingness to speak up (see Figure 1; in the text below the hypotheses are numbered between brackets).

Team psychological safety is defined as *"a shared belief that the team is safe for interpersonal risk taking"* (Edmondson, 1999, p. 354). A recent meta-analysis showed that employee perceptions of direct supervisor's behaviour play a crucial role in fostering (team)

psychological safety (Frazier, Fainshmidt, Klinger, Pezeshkan, & Vracheva, 2017). Various leadership behaviours were found to be relevant, including being accessible to employees, inviting and appreciating staff contributions and ensuring behavioural integrity (i.e., practise what you preach) (Hirak, Peng, Carmeli, & Schaubroeck, 2012; Leroy et al., 2012; Nembhard & Edmondson, 2006). So, psychological safety seems to be encouraged especially when employees experience supportive leadership (Newman, Donohue, & Eva, 2017), which is in line with a commitment-based safety management approach (hypothesis 1a) (Alingh et al., 2015). In contrast, control-based safety management rather entails a risk of creating a climate of mistrust or even a culture of blame (hypothesis 1b) (Khatri, Halbesleben, Petroski, & Meyer, 2007). Prior research has shown that employee perceptions of the (team) psychological safety are positively related to open communication, speaking up, individual and team learning as well as organisational performance (Edmondson & Lei, 2014; Newman et al., 2017). If leaders create a climate in which their staff feels psychologically safe, the benefits of speaking up in terms of preventing patient harm are more likely to outweigh the costs in terms of potentially negative personal consequences in healthcare professionals' decision whether or not to voice their concerns (hypothesis 3) (Edmondson & Lei, 2014; Morrison, 2011; Newman et al., 2017).

A climate for safety reflects employees' shared "*perceptions of the priority of safety at their unit*" (Zohar, Livne, Tenne-Gazit, Admi, & Donchin, 2007, p. 1312). Leaders are considered to *create* this climate (Zohar, 2010) by showing commitment, aligning their words and deeds, and clearly signalling that delivering safe care is important (hypothesis 2a) (Barling & Hutchinson, 2000; Leroy et al., 2012; McFadden, Stock, & Gowen III, 2015). Employees may also get the message that patient safety is highly valued if their manager emphasises safety rules and procedures (Clarke, 2010) and provides them with feedback on safety compliance (hypothesis 2b) (Alingh et al., 2015). Prior research has shown that a climate for safety is positively related to employees' safety motivation as well as patient safety performances (e.g., reported treatment errors) (Leroy et al., 2012; Neal & Griffin, 2006). In line with this, employees may experience normative pressures to voice safety concerns and consider it more worthwhile to speak up if their direct supervisor demonstrates that patient safety is highly valued (hypothesis 4) (Morrow et al., 2016; Robbins & McAlearney, 2016).

Extending the aforementioned lines of reasoning, team psychological safety and climate for safety might have a mediating role in the relationship between the safety management approaches and employees' speaking up (hypotheses 5a and 5b) (Cafferkey & Dundon, 2015; Edmondson & Lei, 2014; Newman et al., 2017). The current study, first, aims to gain insight into the direct relationships between control- and commitment-based safety management, (team) psychological safety and climate for safety, and between (team) psychological safety, climate for safety and nurses' willingness to speak up about patient safety concerns in clinical hospital wards. Subsequently, we explore the potential mediating role of nurses' perceptions of the team psychological safety and climate for safety.

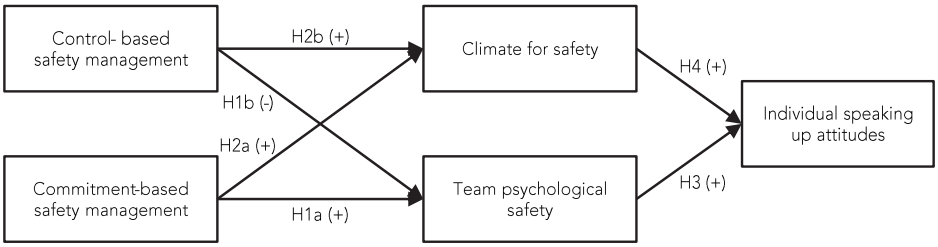


Figure 1 Hypothesised model
Hypothesis 1: (a) Commitment-based safety management is positively, and (b) control-based safety management is negatively related to team psychological safety.
Hypothesis 2: (a) Commitment-based and (b) control-based safety management are positively related to climate for safety.
Hypothesis 3: Team psychological safety is positively related to speaking up.
Hypothesis 4: Climate for safety is positively related to speaking up.
Hypothesis 5: (a) Team psychological safety and (b) climate for safety mediate the relationship between the safety management approaches and speaking up.

METHODS

Study design

We conducted a cross-sectional survey study among nurses and nurse managers working in clinical hospital wards in the Netherlands. Data were collected using two different questionnaires: one for nurses and one for nurse managers (i.e., the direct supervisors of these nurses). The nurse managers answered questions on the 'actual' safety management approaches they put into practice, whereas nurses rated their perceptions of the safety management approaches implemented by the nurse manager by whom they are supervised. The safety management approaches were rated by both groups of respondents in order to explore a potential divergence between manager-ratings and employee-ratings of the management approaches (Den Hartog, Boon, Verburg, & Croon, 2013; Liao, Toya, Lepak, & Hong, 2009) as well as a potential variation in the strength of the associations between the management approaches and nurses' safety-related attitudes and behaviour. According to the literature, employee perceptions of a management approach appear to be stronger predictors of employee behavioural reactions than are manager-ratings of the management practices used in a department (Nishii & Wright, 2007). Furthermore, in order to test the associations between the safety management approaches, climate and speaking up (hypotheses 1–5, see Figure 1), nurses did also answer questions about the departmental climate for safety, psychological safety and their willingness to speak up about patient safety concerns. During the analysis we took into account the hierarchical nature of the data, as the nurses are nested within wards that are managed by a nurse manager.

The Ethics Review Board confirmed that our study was outside the scope of the Netherlands' Medical Research Involving Human Subjects Act and that the rights and privacy of study participants have been taken into account sufficiently (Administration number: EC-2017.62).

Sample

Via hospital associations, all of the 84 Dutch hospitals were invited to participate, resulting in a sample of seven general hospitals, eight top-clinical teaching hospitals and two university medical centres (respectively 15%, 29% and 25% of all hospitals in the Netherlands) (Dutch Hospitals Association, 2015). Between September 2014 and May 2015, all of the nurse managers and nurses working at the 334 clinical wards in these hospitals (i.e., medical wards, surgical wards and intensive care units) were invited to complete a questionnaire. All of the nurses hold a staff position; they provided direct patient care and were not directly involved in managerial tasks within their department. Potential participants received a letter or email to inform them of the study purpose and to ask them to participate anonymously; the correspondence included a link to the online questionnaire. Non-responders received reminders after two and four weeks. No incentives in the form of money or gifts were offered. Passive consent was obtained from all participants as they voluntary agreed to complete the questionnaire and were free to quit at any time during the research.

Measures

Nurse managers rated the safety management approach they put into practice. Nurses answered questions on the perceived safety management approach of their direct supervisor (i.e., the nurse manager of their ward), the climate for safety, psychological safety and their speaking up intentions. Three nurses as well as three nurse managers were interviewed to check the comprehension of items before we determined the content of the final version of the questionnaire.

Control- and commitment-based safety management. Nurses' perceptions of the safety management approaches used by their direct supervisor were measured using the 33-item ConCom Safety Management Scale (Alingh, Strating, van Wijngaarden, Paauwe, & Huijsman, 2018). An example item is: "The actions of my supervisor show that patient safety is a top priority". All items were answered on a 4-point or 5-point Likert scale plus the option 'I don't know'. The item scores were respectively multiplied by five or four to calculate mean scores on a 20-point scale. Higher scores indicate that nurses perceive more control- or commitment-based safety management. For both management approaches, aggregation of the data to the ward level was justified (control-based safety management ICC(1)=0.19, ICC(2)=0.71, mean r_{wg}=0.97; commitment-based safety management ICC(1)=0.32, ICC(2)=0.83, mean r_{wg}=0.97) (Klein & Kozlowski, 2000). Cronbach's

alpha of the aggregated scales was 0.86 for control and 0.97 for commitment-based safety management.

Nurse managers answered the same set of items, although here the items were adapted in order to assess self-rated control- and commitment-based safety management approaches. To illustrate, in the aforementioned item "The actions of my supervisor" was replaced by "I". In other words, nurse managers responded to the item "I show that patient safety is a top priority". For supervisors, two items were dropped from the initial commitment-based management scale because of high risks of socially desirable answers (namely: "My supervisor does not actually prioritise safety issues as highly as he/she says he/she does" and "Regarding safety, my supervisor's words do not match his/her deeds"). Confirmatory factor analysis provided support for construct validity of the scale measured among nurse managers (χ^2=2090.52, df=456, p<0.05; RMSEA=0.04; TLI=0.98; CFI=0.98). Cronbach's alpha was 0.74 for control and 0.80 for commitment-based safety management.

Team psychological safety was measured using the seven-item scale developed by Edmondson (1999). Items were answered on a 5-point Likert scale, ranging from completely disagree (1) to complete agree (5) and included "If you make a mistake in this team, it is often held against you". Higher scores indicate that nurses feel safer to take interpersonal risks. We obtained support for aggregating data to the ward level (ICC(1)=0.09, ICC(2)=0.50, mean r_{wg}=0.92) (Klein & Kozlowski, 2000). Cronbach's alpha of the aggregated scale was 0.77.

Climate for safety was measured using one dimension of the organisational climate scale by Patterson and colleagues (2005) aligning with the recent interest to focus on facet-specific climates, that is, climates that focus on a specific goal of the organisation (Kuenzi & Schminke, 2009). Climate for safety was measured with the four items from the climate for quality scale adapted from a "quality" to a "patient safety" perspective (Patterson et al., 2005). The scale of Patterson and colleagues best fitted our conceptualisation of a climate for safety because we specifically focused on the perceived importance of patient safety rather than adopting a more hybrid definition incorporating multiple climate dimensions such as common in patient safety literature (Halligan & Zecevic, 2011; Zohar et al., 2007). The items were appropriately modified to the ward level: "Patient safety is taken very seriously in this department". All items were answered using a 4-point Likert scale ranging from totally not true (1) to totally true (4). Higher scores indicate that nurses consider patient safety to be more valued within their ward. We obtained support for aggregating data to the ward level (ICC(1)=0.12, ICC(2)=0.59, mean r_{wg}=0.90) (Klein & Kozlowski, 2000). Cronbach's alpha of the aggregated scale was 0.81.

Individual speaking up attitudes were assessed using a three-item scale based on the communication openness scale (Smits, Christiaans-Dingelhoff, Wagner, van der Wal, & Groenewegen, 2008). In this study, items were specifically targeted at the individual level:

"I speak up if I see something that may negatively affect patient care", "I feel free to question the decisions or actions of those with more authority" and "I am afraid to ask questions when something does not seem right". All items were answered using a 5-point Likert scale ranging from never (1) to always (5). Higher scores indicate that nurses are more willing to speak up. Speaking up was found to be an individual level construct (ICC(1)=0.04, ICC(2)=0.29, mean r_{wg}=0.90) (Klein & Kozlowski, 2000). Cronbach's alpha of this scale was 0.77.

Mean scores were calculated for all of the subscales included in the analysis. To calculate the mean, all of the items scores were added up and then divided by the total number of items in the specific subscale (Field, 2013).

Analysis

A total of 302 nurse managers (response rate 42%) and 2,627 nurses (response rate 22%) completed the survey. We were unable to conduct a non-response analysis because we did not have insight into the relevant characteristics of all of the nurses invited to complete a questionnaire. Yet in terms of age and gender, the characteristics of nurses in our sample resemble the characteristics of the nursing workforce in Dutch hospitals in general (CBS StatLine, 2016). Respondents were included in the analysis if they answered a maximum of 20% of the control- and commitment-based safety management items with the option "I don't know" and gave valid scores for all items of the team psychological safety, climate for safety and speaking up scales. A ward is in turn included in the analysis if one nurse manager and at least five nurses working under direct supervision of this nurse manager met the inclusion criteria, well exceeding the minimum number of respondents per group as recommended by Gerhart et al. (2000) and used in previous studies (e.g., Leroy et al., 2012). More details about the sample selection are available in Figure 2.

First, descriptive statistics and correlations were calculated at ward level for all of the subscales. In order to compare managers' ratings and nurses' perceptions of control- and commitment-based safety management, we conducted paired samples t-tests (2-tailed). A manager's self-rated safety management approach was compared with the (aggregated) perceptions of the nurses working under direct supervision of this particular manager. Furthermore, correlation coefficients were used to gain insight into the strength of the relationships between the manager-rated and nurse-rated management approaches, climate and nurses' speaking up intentions. Subsequently, we used the data collected from nurses to test the associations between the perceived safety management approaches, climate for safety, psychological safety and nurses' willingness to speak up (hypotheses 1–5). Hierarchical regression analyses were carried out to assess the relationships between nurse-perceived safety management and team psychological safety as well as climate for safety. In the analysis, we adjusted for differences between types of wards or hospitals as well as group size, both of which might influence nurses' willingness

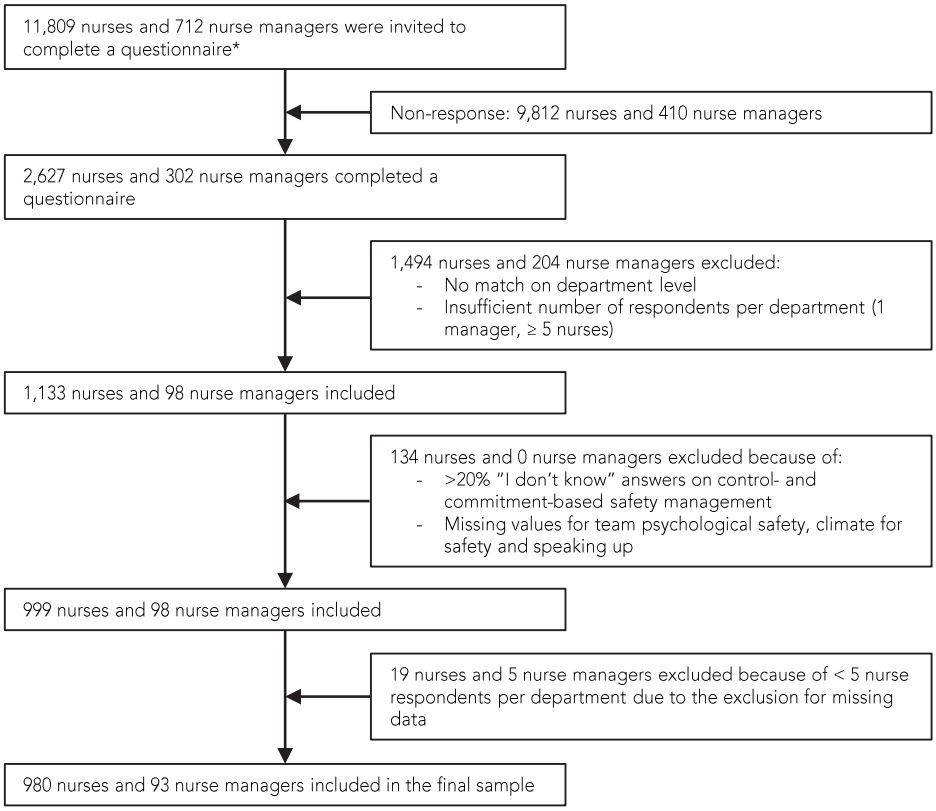


Figure 2 Selection process respondents
* The total number of nurses and nurse managers that were approached to participate may be somewhat overestimated because in six hospitals we were unable to differentiate between occupational groups. Therefore, in these hospitals we counted all of the healthcare professionals and managers who received a questionnaire rather than only the nurses and nurse managers.

to speak up (Morrison, 2011). Therefore, we included the following control variables: type of department (ICU, medical, surgical or mixed ward), type of hospital (general hospital or top-clinical teaching hospital / university medical centre) and the number of respondents per ward. The hierarchical regression analyses were conducted at the ward level of analysis. To examine the association between climate for safety or team psychological safety and nurses' speaking up attitudes, multilevel regression analyses were conducted to take into account the hierarchical nature of our data (Snijders & Bosker, 1999). After all, data on climate for safety and team psychological safety were aggregated to the ward level, whereas nurses' willingness to speak up was found to be an individual-level construct. In these multilevel analyses, we adjusted for individual characteristics associated with variation in speaking up (Morrison, 2011) – namely gender, tenure within the department (in

years) and type of contract (open-ended or fixed-term) – as well as type of ward, type of hospital and number of respondents per department.

To assess mediation effects, we used the procedure recommended by MacKinnon, Fairchild and Fritz (2007). According to these guidelines, a mediation effect exists when the independent variable (i.e., nurse-rated control- or commitment-based safety management) has a significant effect on the mediating variable (i.e., team psychological safety, climate for safety) and the mediating variable has, in turn, a significant effect on the dependent variable (i.e., speaking up attitudes). Finally, we performed two-tailed Sobel tests (Sobel, 1982) and the Monte Carlo method using bootstrapping to assess the significance of a mediation effect (MacKinnon, Lockwood, & Williams, 2004). All analyses were conducted using SPSS V23.0. Results are considered statistically significant if $p<0.05$.

RESULTS

A total of 93 clinical wards with 93 nurse managers and 980 nurses were included in this study (see Table 1). The clinical wards consisted of 50 medical, 23 surgical, 9 mixed medical/surgical wards and 11 ICUs. Per ward, one nurse manager and an average of 11 nurses (range 5-40) completed the questionnaire.

Table 2 presents means, standard deviations and correlations at ward level between the included variables. Small (but positive) correlations are found between manager-rated and nurse-rated control- and commitment-based safety management, respectively $r=0.30$ ($p<0.01$) and $r=0.18$. Paired-samples t-tests reveal statistically significant differences in control-based safety management scores between nurse managers (M=15.73, SD=1.46) and the nurses working under these nurse managers (M=14.77, SD=0.94), $t(92)=6.28$, $p<0.001$. For commitment-based management, significant differences between nurse managers (M=16.68, SD=1.28) and nurses (M=15.31, SD=1.57) are found as well, $t(92)=7.19$, $p<0.001$. Furthermore, only small correlations were found between manager-rated control- and commitment-based safety management and nurses' attitudes and speaking up intentions (r ranges from -0.01 to 0.14). Nurses' perceptions of the management approaches were more strongly related to climate for safety, team psychological safety and nurses' speaking up attitudes (r ranges from 0.17 to 0.72). Therefore, nurse-ratings of the safety management approaches will be used to test our hypotheses.

Table 1 Sample characteristics nurses and nurse managers

Characteristics	Nurses (N=980)		*Nurse managers (N=93)*	
Age	*Mean (range)*	*SD*	*Mean (range)*	*SD*
Age in years	40.4 (18 – 65)	11.6	44.9 (28 – 63)	9.3
Gender	*N*	*%*	*N*	*%*
Male	124	12.7	15	16.1
Female	830	84.7	78	83.9
Missing	26	2.7	-	-
Tenure	*Mean (range)*	*SD*	*Mean (range)*	*SD*
In the current position	12.0 (0 – 47)	9.7	*9.2 (0 – 35)*	*8.3*
In the clinical department	10.3 (0 – 45)	8.5	*9.6 (0 – 32)*	*8.0*
In the hospital	14.6 (0 – 45)	10.5	16.8 (0 – 38)	10.0
Contract	*N*	*%*	*N*	*%*
Open-ended contract	910	92.9	89	95.7
Fixed-term contract	55	5.6	3	3.2
Missing	15	1.5	1	1.1%
Job position nurses	*N*	*%*		
Registered nurse	932	95.1		
Student nurse	*29*	3.0		
Nurse practitioner	19	1.9		

Table 2 Means, standard deviations and correlations at ward level (N=93)

Variable	Mean	SD	1	2	3	4	5	6
1. Manager-rated control-based safety management †	15.73	1.46						
2. Manager-rated commitment-based safety management †	16.68	1.28	.60**					
3. Nurse-rated control-based safety management †	14.77	.94	.30**	.14				
4. Nurse-rated commitment-based safety management †	15.31	1.57	.21*	.18	.68**			
5. Climate for safety ‡	3.31	.21	.13	.03	.72**	.53**		
6. Team psychological safety §	3.89	.23	.02	.10	.44**	.48**	.42**	
7. Speaking up §	3.89	.24	.14	-.01	.20	.17	.21*	.20

Pearson correlations are reported at the ward level of analyses.
*p<0.05 (2-tailed); **p<0.01 (2-tailed).
† scores of this scale could range from 4 to 20; ‡ scores of this scale could range from 1 to 4; § scores of this scale could range from 1 to 5.

Hierarchical regression analyses show that none of the control variables has a significant impact on team psychological safety neither on climate for safety (see Table 3). A significantly positive association is found between nurse-rated commitment-based safety management and team psychological safety (β=0.36; p<0.01). The safety management

approaches explain an additional 24% of the variance of team psychological safety compared with a model that only includes the control variables. These results provide support for hypothesis 1a whereas hypothesis 1b is rejected (β=0.18; n.s.). Furthermore, a significantly positive association is found between nurse-perceived control-based safety management and climate for safety (β=0.74; $p<0.001$). Here, a model in which both management approaches are included explains an additional 56% of the variance of climate for safety compared with a model in which we only include the control variables. These results provide support for hypothesis 2b whereas hypothesis 2a is rejected (β=0.05; n.s.).

Table 3 Hierarchical regression analyses of nurse-rated safety management approaches on climate for safety and team psychological safety (N=93)

	Team psychological safety		Climate for safety	
	model 1 β	model 2 β	model 1 β	model 2 β
Control variables				
Type of ward, reference category ICUs				
Medical wards	.23	.17	-.10	-.25*
Surgical wards	.22	.11	-.02	-.26*
Mixed medical/surgical wards	.20	.18	.08	.04
Type of hospital (top-clinical/UMC)	.16	.13	-.05	-.12
Number of respondents per department	-.04	-.05	-.07	-.05
Safety management approaches				
Nurse-rated control-based safety management		.18		.74***
Nurse-rated commitment-based safety management		.36**		.05
(Δ) R^2	.06	.24	.02	.56
F value	1.16	5.36***	.43	17.33***

*$p<0.05$; **$p<0.01$; ***$p<0.001$

Table 4 presents the multilevel analyses of the relationships between team psychological safety, climate for safety and nurses' speaking up attitudes. Model 1 shows that the control variable tenure within the department has a significant effect on nurses' willingness to speak up (B=0.01; t=2.11; $p<0.05$). In model 2, both management approaches were added to the analysis, followed by team psychological safety and climate for safety in model 3. Nurses' perceptions of neither control- (B=0.02; n.s.) nor commitment-based safety management (B=0.02; n.s.) were found to be significant predictors of nurses' willingness to speak up; nor was climate for safety (B=0.15; n.s.). Only team psychological safety was significantly and positively related to nurses' speaking up intentions (B=0.24; t=2.04; $p<0.05$). As a result hypothesis 3 is supported, whereas hypothesis 4 is rejected.

Mediation of climate for safety is precluded since no significant relationship was found between climate for safety and speaking up. Team psychological safety did, however, meet the criteria for mediation (MacKinnon et al., 2007). Results of a two-tailed Sobel test show that team psychological safety marginally significantly mediates the relationship between nurse-rated commitment-based safety management and nurses' willingness to speak up (t=1.67; $p<0.1$). Additional bootstrap results (2,000 samples) provide further support for mediation because zero is not included in the 95% confidence interval (Bootstrap 95% CI: lower level 0.0003, upper level 0.0295). As a result hypothesis 5a is supported, whereas hypothesis 5b is rejected.

Table 4 Multilevel analyses of climate for safety and team psychological safety on nurses' speaking up attitudes

	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Constant	4.11	.17	3.47	.42	2.67	.53
Individual level						
Nurses' gender (female)	-.02	.06	-.02	.06	-.03	.06
Nurses' tenure within the department	.01*	.00	.01*	.00	.00*	.00
Nurses' type of contract (fixed-term contract)	-.15	.09	-.15	.09	-.15	.09
Ward level						
Type of ward, reference category ICUs						
Medical wards	-.08	.07	-.07	.07	-.07	.07
Surgical wards	-.14	.08	-.12	.08	-.13	.08
Mixed medical/surgical wards	-.13	.10	-.12	.10	-.09	.10
Type of hospital (top-clinical/UMC)	.02	.05	.02	.05	.03	.05
Number of respondents per department	.00	.00	.00	.00	.00	.00
Nurse-rated control-based safety management			.02	.04	-.01	.04
Nurse-rated commitment-based safety management			.02	.02	.00	.02
Team psychological safety					.24*	.12
Climate for safety					.15	.17
Variance components						
Individual level	.341 (.02)		.342 (.02)		.342 (.02)	
Ward level	.010 (.01)		.008 (.01)		.005 (.01)	
-2 Log Likelihood	1634.57		1630.93		1625.51	

Analyses based on data of 980 nurses working at 93 clinical wards
*$p<0.05$

DISCUSSION

This study aimed to explore the relationships between control- and commitment-based safety management, climate for safety, team psychological safety and speaking up of nurses working in clinical hospital wards. In line with prior evidence (Den Hartog et al., 2013; Liao et al., 2009), results reveal a divergence between nurses' and managers' perceptions of the safety management approaches that managers put into practice: nurse managers say they do more on safety management than what is actually perceived by nurses. An explanation for this discrepancy could be that nurses' perceptions of the management approaches are influenced by variation in the actual management practices and also by the quality of communication of their direct supervisor, their attributions of the motives underlying management practices and individual characteristics (Den Hartog et al., 2013; Nishii, Lepak, & Schneider, 2008; Nishii & Wright, 2007). In other words, nurses are possibly not always aware of everything their manager does with regard to patient safety management. If nurses perceive that their nurse manager stresses the importance of safety rules, monitors compliance and provides them with feedback (i.e., control-based safety management), they consider patient safety to be highly valued (climate for safety). Nurses who perceive that their direct supervisor shows commitment and role modelling behaviour, creates awareness and encourages them to participate (i.e., commitment-based safety management), perceive the environment to be psychologically safe for taking interpersonal risks. Team psychological safety is found to be positively related to nurses' willingness to speak up. In other words, when nurses feel safer to take interpersonal risks, they will more frequently raise concerns about patient safety issues. Furthermore, the relationship between nurse-perceived commitment-based safety management and speaking up attitudes is found to be fully mediated by team psychological safety (MacKinnon et al., 2007).

In contrast with prior research (e.g., Leroy et al., 2012; McFadden et al., 2015), no statistically significant association was found between nurses' perceptions of commitment-based safety management and climate for safety. Post-hoc analysis showed that in the absence of control-based management, perceived commitment-based safety management does positively relate to climate for safety but this effect is cancelled out if both management approaches are included in the analysis simultaneously. Thus, our results suggest that nurses in clinical wards receive stronger signals that patient safety is prioritised if their managers emphasise safety rules and foster compliance rather than when they create safety awareness, show commitment and encourage participation. Notably, the levels of climate for safety were lower in medical wards and surgical wards compared with ICUs. Prior research already demonstrated differences in safety climate between clinical wards (e.g., Campbell, Singer, Kitch, Iezzoni, Meyer, 2010; Singer et al., 2009), and future research is needed to further explore variation in the priority of patient safety

between different types of wards. Furthermore, against our expectations, nurse-rated control-based management is not negatively related to team psychological safety; in fact, a (non-significant) positive association is found. In the absence of commitment-based management, nurses' perceptions of control-based safety management do significantly and positively relate to team psychological safety but again this effect is cancelled out if both management approaches are included in the analysis. It seems that, in contrast to the negative connotation that control-based management carries in the literature (Khatri et al., 2006; Walton, 1985), nurses do not experience managerial control as a sign of mistrust but rather as a signal that patient safety is highly valued. This might explain why higher levels of perceived control do not damage a trustworthy environment and do not damage the relationships between employees and their supervisors, which are considered important preconditions for team psychological safety (Edmondson & Lei, 2014). Thus, both control- and commitment-based management seem to be relevant for managing patient safety: the former to highlight the priority of delivering safe patient care and the latter to create a climate in which nurses feel psychologically safe to take interpersonal risks.

Our findings confirm prior evidence that psychological safety is positively related to nurses' willingness to speak up and that it mediates the relationship between perceived leader behaviour and employee voice (Edmondson & Lei, 2014; Newman et al., 2017). As established before, team psychological safety mitigates the fear that speaking up will lead to negative repercussions and, consequently, seems to provide a baseline condition for employees to raise concerns (Liang, Farh, & Farh, 2012). Just like Martinez and colleagues (2015), we did however not find a significant relationship between climate for safety and nurses' speaking up attitudes. Possibly, nurses' willingness to speak up is mainly driven by the confidence that raising patient safety concerns will not have negative personal consequences (i.e., team psychological safety), whereas a climate for safety may be more important for other types of voice behaviour, such as coming up with new ideas or suggestions. If nurses experience that patient safety is prioritised, they will perhaps consider it more worthwhile and effective to voice suggestions for patient safety improvement because they expect their input to be taken seriously. Prior research showed that unique patterns of relationships exist between antecedents (e.g., personality traits) and voice behaviour for different types of voice (Liang et al., 2012; Maynes & Podsakoff, 2014). Future research is needed to explore whether this is also the case for the relationship between climate for safety and individual's speaking up attitudes.

Even though our findings strengthen the idea that perceived leader behaviour is a key determinant of employee voice (Ashford et al., 2009), a substantial part of the variance in speaking up still remains unexplained. Our results suggest that the choice to speak up or remain silent about safety concerns typically is an individual consideration, depending on whether the individual nurse feels safe to speak up or not. Prior research showed that

whether somebody dares to speak up is influenced by perceived leader behaviours and also by one's personality, sense of commitment, communication skills, taken-for-granted beliefs and prior experiences with speaking up. Furthermore, situational factors such as team relationships, the type of message to convey (e.g., traditional versus professionalism-related safety threats), the potential patient harm and the perceived effectiveness of speaking up as well as perceptions of organisational support may also guide employee voice behaviour (Detert & Edmondson, 2011; Martinez et al., 2017; Morrison, 2014; Morrow et al., 2016; Nembhard, Labao, & Savage, 2015; Okuyama et al., 2014; Schwappach & Gehring, 2014). Moreover, Kakkar and colleagues (2016) showed that individual traits may interact with situational features to influence employee voice. Therefore, it may be interesting to combine future research on the influence of leader behaviour with individual-level characteristics such as individuals' personality, prior experiences with speaking up and professional commitment (Morrison, 2011; Okuyama et al., 2014).

The present study has some limitations. First, the cross-sectional design does not support causal relations. Although theoretical insights provide support that leader behaviours influence employee attitudes, which do in turn affect employees' willingness to show certain behaviour (Boxall & Purcell, 2011), additional research using longitudinal data is needed to rule out reverse causality. Nurses' attitudes and behaviour could, potentially, also influence the management practices adopted by nurse managers. Second, our analyses are partly based on same source data, entailing a risk of common method bias (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). Although we collected multisource data, single source data were used to test our hypotheses. In line with prior evidence, employees' perceptions of the safety management approaches appear to be more strongly related to employee attitudes and behavioural reactions than manager ratings of the 'actual' management approaches that are put into practice (Liao et al., 2009; Nishii & Wright, 2007). Furthermore, nurses' experiences of the team psychological safety, climate for safety and their intentions towards speaking up can only be mapped by nurses themselves. Third, despite our large sample, the response rate was relatively low, raising questions about representativeness. The characteristics of nurses in our sample do, however, resemble the characteristics of the nursing workforce in Dutch hospitals in general (CBS StatLine, 2016). Fourth, climate for safety was measured using an adapted subscale of the organisational climate scale instead of a previously validated safety climate questionnaire. The scale of Patterson and colleagues (2005) did better fit our facet-specific conceptualisation of a climate for safety than do commonly used safety climate scales, which adopt a more hybrid definition incorporating multiple climate dimensions (Halligan & Zecevic, 2011; Zohar et al., 2007). Fifth, the speaking up scale used in this study focused on individual speaking up attitudes rather than actual voice behaviours. Our study does not give insight whether nurses' willingness to speak up does actually result in the expression of patient safety concerns. Future research is needed to explore the

relationship between perceived control- and commitment-based safety management, climate for safety, team psychological safety and nurses' speaking up behaviour. Finally, in this study, we exclusively focused on nurse managers and nurses in clinical hospital wards. Future research is needed to test whether our findings hold in other settings and for other occupational groups.

In conclusion, this study provides some first evidence that nurses who perceive higher levels of commitment-based safety management feel safer to take interpersonal risks and are more willing to speak up about patient safety concerns. Furthermore, nurses' perceptions of control-based safety management are found to be positively related to a climate for safety, although no association was found with speaking up. Both control- and commitment-based management approaches seem to be relevant for managing patient safety, but when it comes to encouraging individual's speaking up attitudes, a commitment-based safety management approach seems to be most valuable.

Chapter 6

Nurse managers' role in stimulating suggestion-focused voice: A moderated-mediation model of safety management, climate and patient safety

Submitted as:
Alingh, C. W., van de Voorde, K., van Wijngaarden, J. D. H., Huijsman, R., & Paauwe, J. Nurse managers' role in stimulating suggestion-focused voice: A moderated-mediation model of safety management, climate and patient safety

ABSTRACT

Background: Constructive suggestions of nurses are considered important for patient safety. However, little is known about how nurse managers can encourage suggestion-focused voice, neither about the influence of the broader work environment including the climate for safety.

Aim: Explore how control- and commitment-based safety management and climate for safety combine to influence nurses' suggestion-focused voice and the perceived patient safety.

Methods: A cross-sectional survey study resulted in a sample of 957 nurses and 92 nurse managers working in clinical hospital wards. The hypotheses were tested using the PROCESS module of Hayes.

Results: A positive relationship is found between nurses' suggestion-focused voice and the perceived patient safety. Under conditions of a high safety climate, commitment-based management is positively related to suggestion-focused voice and via suggestion-focused voice a positive association is found with nurses' perceptions of patient safety. No significant relationships were found for control-based safety management.

Conclusions: Nurses do more frequently engage in suggestion-focused voice if they perceive higher levels of commitment-based management and, simultaneously, experience that patient safety is (highly) valued within their ward.

Implications for Nursing Management: If nurse managers want to encourage suggestion-focused voice and improve patient safety, they should simultaneously emphasise commitment-based management practices and strengthen the climate for safety.

INTRODUCTION

Professionals are considered essential actors in safety improvement in healthcare because their work provides them with valuable insights into safety concerns as well as solutions (Nembhard, Labao, & Savage, 2015). Nurses, for example, work at the centre of patient care (Institute of Medicine, 2004). Florence Nightingale (1863) illustrated already that this central position enabled her to identify safety-related problems and to offer concrete suggestions for organisational and hygienic improvement, which resulted in a significant reduction in patients' mortality. Constructive suggestions based on the experiences of frontline staff are an important factor in improving organisational performance (Detert, Burris, Harrison, & Martin, 2013; MacKenzie, Podsakoff, & Podsakoff, 2011; Maynes & Podsakoff, 2014). However, employees frequently experience difficulties to voice their concerns or suggestions (Martinez et al., 2017; Maxfield, Grenny, McMillan, Patterson, & Switzler, 2005; Schwappach & Gehring, 2015).

Intentionally expressing suggestions which challenge the status quo with the intention to improve rather than merely criticise is referred to as suggestion-focused (Morrison, 2011), constructive (Maynes & Podsakoff, 2014) or promotive voice (Liang, Farh, & Farh, 2012) and generally presumed a type of extra-role or citizenship behaviour (Van Dyne & LePine, 1998). This in contrast to the expression of concerns about practices, incidents or behaviours that may cause harm to patients or the organisation (i.e., problem-focused voice) which is commonly seen as a professional duty (Morrison, 2011). Healthcare professionals' willingness to raise concerns has recently received considerable attention both in research and in practice (Okuyama, Wagner, & Bijnen, 2014). However, suggestion-focused aspects of voice have largely been overlooked, despite the research interest in other settings (e.g., MacKenzie et al., 2011; Xie, Ling, Mo, & Luan, 2015). Therefore, the current study focuses on suggestion-focused voice regarding patient safety in hospitals.

Employees' willingness to express themselves depends on their perceptions of the risks of voice in terms of potentially negative personal consequences and the benefits in terms of bringing about constructive change (Morrison, 2011; Schwappach & Gehring, 2014). Morrison (2011, p. 398) argues that "*employees may think very differently about the potential benefits and risks of speaking up with a novel suggestion versus an issue of concern*". In fact, suggestion-focused voice is found to be especially subject to individual's sense of commitment to developing improvement, while self-protective motives seem more prominent in the case of problem-focused voice (Liang et al., 2012). Prior research portrayed leadership behaviour as a key feature influencing voice (Ashford, Sutcliffe, & Christianson, 2009). Supportive leaders who welcome ideas, make consistent and fair decisions, and have good relationships with their subordinates may stimulate employees to express ideas or suggestions (e.g., Detert & Burris, 2007; Morrow, Gustavson, & Jones, 2016). When it comes to patient safety, supervisors generally combine elements of two

management approaches to give direction to employee behaviours: control- and commitment-based management (Alingh, van Wijngaarden, Paauwe, & Huijsman, 2015; Walton, 1985). In a control-based safety management approach, managers stress the importance of following safety rules and regulations, monitor compliance and provide employees with feedback. In a commitment-based safety management approach, managers clearly prioritise patient safety by exhibiting role modelling behaviour, show determination to ensuring safe care delivery, encourage employees to participate in safety improvement initiatives and create awareness on safety issues (Alingh et al., 2015).

The organisational safety climate may act as an important boundary conditions for the relationship between the management approaches and employee voice. A safety climate, defined as the *"shared employee perceptions of the priority of safety at their unit"* (Zohar, Livne, Tenne-Gazit, Admi, & Donchin, 2007, p. 1312), may signal to employees whether suggestions for safety improvement are expected and appreciated within their ward (Nembhard et al., 2015). Consequently, the climate for safety may serve as a moderator in the relationship between control- and commitment-based safety management and healthcare professionals' suggestion-focused voice. Hofmann and colleagues (2003) showed, for example, that the relationship between high-quality social exchange among leaders and their subordinates and employees' willingness to engage in discretionary safety behaviours such as suggestion-focused voice is stronger under conditions of a more positive safety climate. A climate in which patient safety is highly valued might thus give direction to employee (discretionary) behaviours.

The limited evidence-base about *when* and *how* safety management approaches affect suggestion-focused voice as well as patient safety, underscores the need for more empirical research exploring these relationships. Therefore, this study aims to explore how control- and commitment-based safety management and climate for safety combine to influence nurses' suggestion-focused voice and their perceptions of the level of patient safety in clinical hospital wards.

THEORETICAL FRAMEWORK

Suggestion-focused voice is presumed to be motivated by the individual's desire to contribute to the organisational functioning in constructive ways (Van Dyne & LePine, 1998). Whether employees consider it worthwhile (and safe) to voice suggestions is influenced by their perceptions of the relationship with and behaviour of their direct supervisor. Research in various settings showed that high-quality relationships between leaders and subordinates (Burris, Detert, & Chiaburu, 2008; Chen, Wang, Chang, & Hu, 2008), leader's openness for suggestions (Detert & Burris, 2007), and their inclusiveness in terms of inviting and appreciating others input (Nembhard & Edmondson, 2006) were positively related to suggestion-focused

voice and related citizenship behaviours. Correspondingly, positive associations were found with supervisor guidance (Dineen, Lewicki, & Tomlinson, 2006), authentic role modelling behaviour (Wong, Spence Laschinger, & Cummings, 2010) and ethical leadership (Walumbwa & Schaubroeck, 2009). These leadership behaviours are in line with a commitment-based safety management approach (Alingh et al., 2015). Moreover, commitment-based management does not rely on minimum performance standards but encourages employees to take initiative, *"go beyond the call of duty"* (Khatri, Baveja, Boren, & Mammo, 2006, p. 118) and continuously improve safety performances (Walton, 1985). In contrast, a control-based safety management approach offers far less room for employee voice and initiative (Walton, 1985). The focus on closely controlling safety behaviours imposes constraints on employee initiative and creativity (Khatri et al., 2006). In line with this, top-down systems that are high in bureaucracy may impede employee voice (Morrison, 2011). Employees may hesitate to offer suggestions because they may fear more regulations and control as well as further restrictions of their professional autonomy. Therefore, we hypothesise:

Hypothesis 1a: *Employee-rated control-based safety management is negatively related to suggestion-focused voice.*

Hypothesis 1b: *Employee-rated commitment-based safety management is positively related to suggestion-focused voice.*

A conventional assumption in the literature is that voice has important benefits in terms of organisational learning, innovation and improved work processes, while silence can be dysfunctional or even harmful to organisations (Morrison, 2014). So far, research on the outcomes of voice has mainly focused on employee-outcomes (e.g., performance evaluations, career outcomes), empirical evidence on unit- or organisational-level outcomes is scarce (Morrison, 2014). An exception are the studies of Podsakoff and colleagues which show that suggestion-focused voice is associated with improved work group task performance, organisational effectiveness and overall performances (MacKenzie et al., 2011; Maynes & Podsakoff, 2014). In healthcare, a positive but non-significant relationship was found between nurses' voice behaviour and their perceptions of the quality of care (Wong et al., 2010). So, the literature provides some indications that departments perform better when employees voice their suggestions. The overall effectiveness of suggestion-focused voice will depend on the nature of the suggestions being voiced as well as the receptivity of and actions taken by the recipient (Morrison, 2014). To illustrate, Detert and colleagues (2013) demonstrated that improvement-oriented voice to a unit leader is positively related to that unit's performance, whereas voice among within-unit colleagues has a negative effect. In the current study we focus on employees' suggestions concerning patient safety given to their direct supervisor. Therefore, we hypothesise:

Hypothesis 2: *Suggestion-focused voice is positively related to the perceived level of patient safety.*

Extending the aforementioned line of reasoning, we expect suggestion-focused voice to mediate the relationship between the management approaches and the perceived level of patient safety. After all, patient safety performance is mainly subject to the actions of frontline staff (Guest, 1997).

Hypothesis 3a: *Suggestion-focused voice mediates the negative relationship between employee-rated control-based safety management and the perceived level of patient safety.*

Hypothesis 3b: *Suggestion-focused voice mediates the positive relationship between employee-rated commitment-based safety management and the perceived level of patient safety.*

Whether or not a leader's actions are indeed associated with employee voice is also influenced by employees' perceptions of the broader work environment, including the climate for safety (Zohar et al., 2007). A safety climate may provide cues about appropriate behaviours and signal whether suggestions concerning patient safety are welcomed (Nembhard et al., 2015). Hofmann and colleagues (2003) found that under conditions of a more positive safety climate employees who experience high-quality leader-member exchange are more likely to view safety citizenship behaviour as part of their formal role responsibilities. Accordingly, employees may engage more frequently in these kind of behaviours. In line with this, the reluctance to voice suggestions in an environment of control-based safety management will potentially be reduced when employees experience higher levels of climate for safety. Furthermore, the positive association between commitment-based safety management and suggestion-focused voice may be strengthened when employees consider patient safety to be prioritised within their ward.

Hypothesis 4a: *Safety climate moderates the relationship between employee-rated control-based safety management and suggestion-focused voice, such that the negative relationship will be weaker for higher levels of a climate for safety.*

Hypothesis 4b: *Safety climate moderates the relationship between employee-rated commitment-based safety management and suggestion-focused voice, such that the positive relationship will be stronger for higher levels of a climate for safety.*

Assuming that the relationship between the safety management approaches and suggestion-focused voice is moderated by the departmental safety climate, it is also likely that safety climate influences the indirect relationship between control- and commitment-based safety management and the perceived level of patient safety through suggestion-focused voice. Hence, we expect a pattern of moderated mediation (see Figure 1).

Hypothesis 5a: *Safety climate moderates the indirect relationship between employee-rated control-based safety management and the perceived level of patient safety, through suggestion-focused voice, such that the negative indirect relationship will be weaker for higher levels of a climate for safety.*

Hypothesis 5b: *Safety climate moderates the indirect relationship between employee-rated commitment-based safety management and the perceived level of patient safety, through suggestion-focused voice, such that the positive indirect relationship will be stronger for higher levels of climate for safety.*

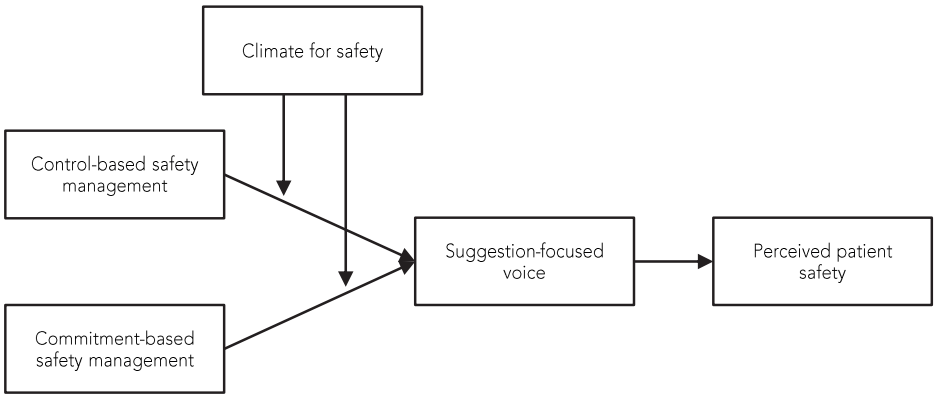


Figure 1 Conceptual model

METHODS

Setting and design

We conducted a cross-sectional survey study among nurses and nurse managers working in clinical hospital wards in the Netherlands. Via hospital associations, all of the 84 Dutch hospitals were invited to participate, resulting in a sample of seven general hospitals, eight top-clinical teaching hospitals and two university medical centres (UMC) (respectively 15%, 29% and 25% of all of the hospitals in the Netherlands) (Dutch Hospitals

Association, 2015). Between September 2014 and May 2015, all of the nurses and nurse managers (i.e., the direct supervisors of these nurses) working at the 334 clinical wards in these hospitals (i.e., medical wards, surgical wards, intensive care units (ICUs)) were invited to complete a questionnaire. All of the nurses hold a staff position; they provide direct patient care and are not directly involved in managerial tasks within their ward. Potential participants received a letter or email to inform them of the study purpose and to ask them to participate anonymously. The correspondence included a link to the online questionnaire. Non-responders received reminders after two and four weeks. No incentives in the form of money or gifts were offered.

The Ethics Review Board confirmed that our study was outside the scope of the Netherlands' Medical Research Involving Human Subjects Act and that the rights and privacy of study participants have been taken into account sufficiently (Administration number: EC-2017.62). Passive consent was obtained from all participants as they voluntary agreed to complete the questionnaire and were free to quit at any time during the research.

Measures

In this study, nurses answered questions about the perceived safety management approaches, climate for safety and level of patient safety within their ward. Nurse managers assessed suggestion-focused voice of the nurses whom they supervise. All of the analyses are conducted at ward level.

Control- and commitment-based safety management. Nurses' perceptions of the safety management approaches used by their direct supervisor were measured using the 33-item ConCom Safety Management Scale (Alingh, Strating, van Wijngaarden, Paauwe, & Huijsman, 2018). An example item is: "The actions of my supervisor show that patient safety is a top priority". All items were answered on a 4-point or 5-point Likert scale plus the option 'I don't know'. The item-scores were respectively multiplied by five or four to calculate mean scores on a 20-point scale. Higher scores indicate that nurses perceive more control- or commitment-based safety management. For both management approaches, aggregation of data to ward level was justified (control-based safety management ICC(1)=0.19, ICC(2)=0.71, mean r_{wg}=0.97; commitment-based safety management ICC(1)=0.33, ICC(2)=0.83, mean r_{wg}=0.97) (Klein & Kozlowski, 2000). Cronbach's alpha of the aggregated scales was 0.86 for control- and 0.97 for commitment-based safety management.

Climate for safety was measured using one dimension of the organisational climate scale by Patterson and colleagues (2005), aligning with the recent interest to focus on facet-specific climates (Kuenzi & Schminke, 2009). Climate for safety was measured using the 4-item climate for quality scale, adapted from a "quality" to a "patient safety" perspective. The scale of Patterson and colleagues best fitted our conceptualisation of a climate for safety because we specifically focused on the perceived importance of patient safety rather than adopting a more hybrid definition incorporating multiple dimensions

such as common in patient safety literature (Halligan & Zecevic, 2011; Zohar et al., 2007). The items were reformulated to the ward level: "Patient safety is taken very seriously in this department". All items were answered using a 4-point Likert scale ranging from totally not true (1) to totally true (4). Higher scores indicate that nurses consider patient safety to be more valued within their ward. We obtained support for aggregating climate for safety to ward level (ICC(1)=0.11, ICC(2)=0.57, mean r_{wg}=0.90) (Klein & Kozlowski, 2000). Cronbach's alpha of the aggregated scale was 0.80.

Perceived patient safety was measured using the 4-item 'overall perceptions of safety' scale which is part of the Dutch version of the Hospital Survey on Patient Safety Culture (Smits, Christiaans-Dingelhoff, Wagner, van der Wal, & Groenewegen, 2008). An example item is "We have patient safety problems in this unit". All items were answered using a 5-point Likert scale ranging from totally disagree (1) to totally agree (5). Higher scores indicate that nurses perceive patient care within their ward to be safer. We obtained support for aggregating perceived patient safety to the ward level (ICC(1)=0.23, ICC(2)=0.75, mean r_{wg}=0.85) (Klein & Kozlowski, 2000). Cronbach's alpha of the aggregated scale was 0.81.

Suggestion-focused voice. Nurse managers answered the 6-item voice scale of Van Dyne & LePine (1998) to assess suggestion-focused voice of the nurses working in their ward. In this study, the items were specifically targeted at patient safety. To illustrate, "Employees make recommendations concerning issues that affect patient safety". All items were answered using a 5-point Likert scale ranging from totally disagree (1) to totally agree (5). Higher scores indicate that nurses offer more suggestions. Cronbach's alpha of this scale was 0.85.

Control variables. In the analyses, we adjusted for type of ward (ICU, medical, surgical or mixed ward), type of hospital (general hospital, top-clinical hospital / UMC) and the number of respondents per ward.

Mean scores were calculated for all of the subscales included in the analysis. To calculate the mean, all of the items scores were added up and then divided by the total number of items in the specific subscale (Field, 2013).

Analysis

A total of 302 nurse managers (response rate 42%) and 2,627 nurses (response rate 22%) completed the survey. The characteristics of nurses in our sample resemble the characteristics of the nursing workforce in Dutch hospitals in general (CBS StatLine, 2016). However, we were unable to conduct a non-response analysis because we did not have insight into the relevant characteristics of all of the nurses in the participating hospitals. Respondents are included in the analysis if they answered a maximum of 20% of the control- and commitment-based safety management items with the option "I don't know" and gave valid scores for all items of the climate for safety, perceived patient safety and suggestion-focused voice scales. A ward is included in the analysis if one nurse

manager and at least five nurses working under direct supervision of this nurse manager met the inclusion criteria, well exceeding the minimum number of respondents per group as recommended by Gerhart et al. (2000) and used in previous studies (e.g., Leroy et al., 2012). More details about the sample selection are available in Figure 2.

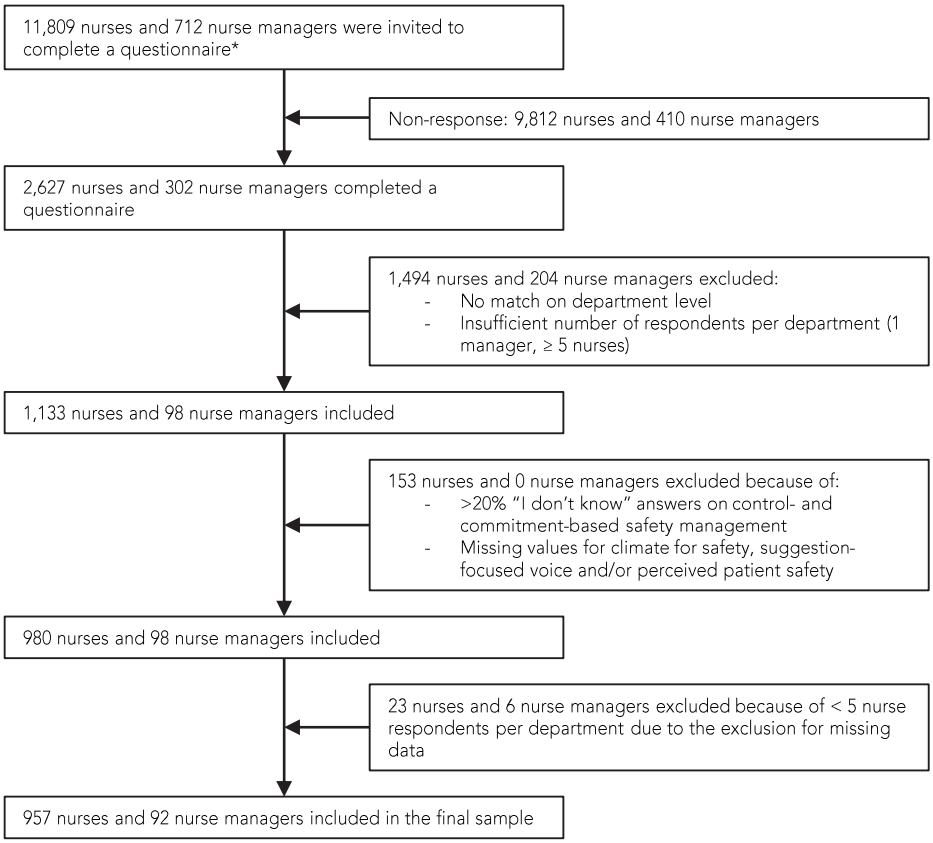


Figure 2 Selection process respondents

* The total number of nurses and nurse managers may be somewhat overestimated because in six hospitals we were unable to differentiate between occupational groups. Therefore, in these hospitals we counted all respondents who received a questionnaire.

All of our hypotheses are tested at ward level. First, descriptive statistics and correlations for all of the scales were calculated. We tested our hypotheses using the regression-based bootstrapping method in the PROCESS module developed by Hayes (2013). Three separate models were tested for both control- and commitment-based safety management. A simple mediation model is used to test the direct and indirect effects of nurse-rated control- and commitment-based safety management on suggestion-focused voice and

the perceived level of patient safety (hypotheses 1 to 3). Subsequently, a simple moderation model is tested to gain insight into the moderating role of climate for safety in the relationship between the perceived management approaches and suggestion-focused voice (hypothesis 4). Finally, we analysed a moderated mediation model – also referred to as conditional process analyses – to test the conditional indirect effects of perceived control- and commitment-based safety management on the perceived level of patient safety at different values of climate for safety (hypothesis 5). Continuous variables were mean-centred in order to prevent potential multicollinearity issues (Hayes, 2013). All analyses were conducted using SPSS V23.0. Results are considered statistically significant if $p<0.05$.

RESULTS

Sample

A total of 92 clinical wards with 92 nurse managers and 957 nurses were included in this study (see Table 1). The clinical departments consisted of 49 medical, 23 surgical, 9 mixed medical/surgical wards and 11 ICUs. Per ward, an average of 11 nurses (range 5-40) completed the questionnaire.

Table 1 Sample characteristics nurses and nurse managers

Characteristics	Nurses (N=957)		*Nurse managers (N=92)*	
Age	*Mean (range)*	*SD*	*Mean (range)*	*SD*
Age in years	40.4 (18-65)	11.6	44.8 (28-63)	9.4
Gender	*N*	*%*	*N*	*%*
Male	124	13.0	15	16.3
Female	809	84.5	77	83.7
Missing	24	2.5		
Tenure	*Mean (range)*	*SD*	*Mean (range)*	*SD*
In the current position	12.0 (0-47)	9.8	9.3 (0-35)	8.3
In the clinical department	10.3 (0-45)	8.6	9.6 (0-32)	8.1
In the hospital	14.7 (0-45)	10.5	16.7 (0-38)	10.0
Contract	*N*	*%*	*N*	*%*
Open-ended contract	889	92.9	3	3.3
Fixed-term contract	54	5.6	88	95.7
Missing	14	1.5	1	1.1
Job position nurses	*N*	*%*		
Registered nurse	909	95.0		
Student nurse	29	3.0		
Nurse practitioner	19	2.0		

Table 2 presents means, standard deviations and correlations of the variables included in our analyses. Nurse-rated control- and commitment-based safety management correlate positively with climate for safety and the perceived level of patient safety. No significant correlations were found between the management approaches and suggestion-focused voice, but suggestion-focused voice is positively correlated with nurses' perceptions of the level of patient safety (r=0.30, p<.0.01).

Table 2 Means, standard deviations and correlations

Variable	Mean	SD	1	2	3	4
1. Control-based safety management †	14.75	.94				
2. Commitment-based safety management †	15.30	1.59	.69**			
3. Climate for safety ‡	3.31	.21	.72**	.54**		
4. Suggestion-focused voice §	3.89	.46	.06	.19	.06	
5. Perceived level of patient safety §	3.40	.36	.53**	.52**	.66**	.30**

Pearson correlations are reported at ward level.
*p<0.05 (2-tailed); **p<0.01 (2-tailed).
† scores of this scale could range from 4 till 20; ‡ scores of this scale could range from 1 till 4; § scores of this scale could range from 1 till 5.

Simple mediation analyses (see Table 3) show that nurses' perceptions of neither control-based (B=-0.02, n.s.) nor commitment-based safety management (B=0.08, p=0.066) had a statistically significant impact on suggestion-focused voice. However, for the latter a marginally significant association was found indicating that if nurses experience higher levels of commitment-based safety management they may more frequently offer suggestions for patient safety improvement. As a result, hypothesis 1a is rejected and marginal support is found for hypothesis 1b. Consistent with hypothesis 2, results reveal a significant and positive relationship between nurses' suggestion-focused voice and their perceptions of patient safety within the ward (B=0.16, p<0.01). In other words, higher levels of nurses' suggestion-focused voice are associated with more positive perceptions of the level of patient safety. No support was found for the mediating role of suggestion-focused voice in the relationship between nurse-rated control-based safety management and the perceived level of patient safety, as the 95% confidence interval included zero [95% CI: -0.05, 0.04]. Therefore, hypothesis 3a is rejected. In addition, non-significant results were found for the indirect effect of nurses' perceptions of commitment-based safety management on the perceived level of patient safety through suggestion-focused voice [95%CI: -0.00, 0.04] However, significant results were found at a 90% confidence interval [90% CI: 0.00, 0.03], providing marginal support for hypothesis 3b.

Table 3 Regression results for the direct and indirect effects of perceived control- and commitment-based safety management on suggestion-focused voice and perceived patient safety

Predictor	B	SE	t
Mediator variable model: suggestion-focused voice: R^2=.09, F(8,83)=1.00			
Constant	3.92	.85	4.60***
Control-based safety management	-.02	.09	-.24
Commitment-based safety management	.08	.04	1.86
Climate for safety	-.16	.35	-.46
Type of ward (reference category ICUs)			
Medical wards	-.29	.17	-1.75
Surgical wards	-.26	.18	-1.43
Mixed medical/surgical wards	-.16	.21	-.75
Type of hospital (reference category top-clinical/ UMC)	.01	.11	.11
Number of respondents per ward	-.01	.01	-1.36
Dependent variable model: perceived patient safety: R^2=.57, F(9,82)=12.26***			
Constant	-.82	.51	-1.61
Suggestion-focused voice	.16	.06	2.66**
Control-based safety management	.06	.05	1.10
Commitment-based safety management	.04	.02	1.59
Climate for safety	.73	.19	3.84***
Type of ward (reference category ICUs)			
Medical wards	-.19	.09	-2.11*
Surgical wards	-.22	.10	-2.24*
Mixed medical/surgical wards	.02	.11	.18
Type of hospital (top-clinical/UMC)	-.06	.06	-.91
Number of respondents per ward	.00	.00	.01

Indirect effect of control-based safety management on perceived patient safety through suggestion-focused voice

	B	SE	LL 95% CI	UL 95% CI
Suggestion-focused voice	-.00	.02	-.05	.04

Indirect effect of commitment-based safety management on perceived patient safety through suggestion-focused voice

	B	SE	LL 95% CI	UL 95% CI
Suggestion-focused voice	.01	.01	-.00	.04

*p<0.05; **p<0.01; ***p<0.001. Unstandardised regression coefficients are reported.
Bootstrap sample size = 5,000. LL = lower limit, CI = confidence interval, UL=upper limit.

Subsequently, the conditional direct and indirect effects of control- (see Table 4) and commitment-based safety management (see Table 5) were investigated. Results reveal no significant interaction between nurses' perceptions of control-based safety management and climate for safety (B=0.23, n.s.). Neither did we find a significant conditional direct effect of control-based safety management on suggestion-focused voice for any of the different values of climate for safety; therefore, hypothesis 4a is rejected. We did find a significant interaction between nurses' perceptions of commitment-based safety management and climate for safety (B=0.28, p<0.05), providing support for the moderating role of climate for safety. Consistent with hypothesis 4b, the effect of commitment-based safety management on suggestion-focused voice is stronger for higher compared to lower levels of climate for safety. Statistically significant positive effects between perceived commitment-based safety management and suggestion-focused voice were only found for average [95% CI: 0.00, 0.17] and high levels of climate for safety [95% CI: 0.04, 0.24].

In line with the above-mentioned results, a non-significant index of moderated mediation [95% CI: -0.02, 0.14] was found for control-based safety management. Accordingly, no indications were found for indirect effects of nurse-rated control-based safety management on the perceived level of patient safety via suggestion-focused voice for the different values of climate for safety. Therefore, hypothesis 5a is rejected. For nurses' perceptions of commitment-based safety management, a marginally significant index of moderated mediation was found [90% CI: 0.00, 0.10]. The indirect effect of nurse-rated commitment-based management on perceived patient safety through suggestion-focused voice is (marginally) significant at high (B=0.01; 95% CI: 0.00, 0.05) and average values of climate for safety (B=0.01; 90% CI: 0.00, 0.04) but non-significant at low values. nsequently, marginal support is found for hypothesis 5b.

Table 4 Regression results for the conditional direct and indirect effects of perceived control-based safety management on suggestion-focused voice and perceived patient safety

Predictor	B	SE	t
Mediator variable model: suggestion-focused voice: R^2=.11, F(9,82)=1.08			
Constant	3.14	.68	4.64***
Control-based safety management	-.02	.09	-.22
Climate for safety	-.04	.37	-.11
Interaction term control-based safety management and climate for safety	.23	.18	1.29
Commitment-based safety management	.07	.04	1.66
Type of ward (reference category ICUs)			
Medical wards	-.30	.17	-1.83
Surgical wards	-.28	.18	-1.51

Table 4 Regression results for the conditional direct and indirect effects of perceived control-based safety management on suggestion-focused voice and perceived patient safety (continued)

Predictor	B	SE	t
Mixed medical/surgical wards	-.20	.21	-.92
Type of hospital (reference category top-clinical/ UMC)	.04	.11	.37
Number of respondents per ward	-.01	.01	-1.28
Dependent variable model: perceived patient safety: R^2=.50, F(8,83)=10.24***			
Constant	2.45	.44	5.63***
Suggestion-focused voice	.15	.06	2.28*
Control-based safety management	.18	.04	4.14***
Commitment-based safety management	.04	.02	1.73
Type of ward (reference category ICUs)			
Medical wards	-.27	.10	-2.85**
Surgical wards	-.32	.10	-.311**
Mixed medical/surgical wards	.03	.12	.27
Type of hospital (top-clinical/UMC)	-.10	.06	-1.52
Number of respondents per ward	-.00	.01	-.34

Conditional direct effect of control-based safety management on perceived patient safety through suggestion-focused voice

	B	SE	LL 95% CI	UL 95% CI
Climate for safety				
-.21 (-1SD)	-.07	.10	-.27	.13
0 (M)	-.02	.09	-.21	.17
+.21 (+1SD)	.03	.10	-.17	.23

Conditional indirect effect of control-based safety management on perceived patient safety through suggestion-focused voice

	B	SE	LL 95% CI	UL 95% CI
Climate for safety				
-.21 (-1SD)	-.01	.02	-.08	.02
0 (M)	-.00	.02	-.06	.03
+.21 (+1SD)	.00	.02	-.04	.05
Index of moderated mediation	.03	.04	-.02	.14

*p<0.05; **p<0.01; ***p<0.001. Unstandardised regression coefficients are reported.
Bootstrap sample size = 5,000. LL = lower limit, CI = confidence interval, UL=upper limit.

Table 5 Regression results for the conditional direct and indirect effects of perceived commitment-based safety management on suggestion-focused voice and perceived patient safety

Predictor	B	SE	t
Mediator variable model: suggestion-focused voice: R^2=.14, F(9,82)=1.46			
Constant	5.19	1.36	3.83***
Commitment-based safety management	.09	.04	2.07*
Climate for safety	.08	.36	.21
Interaction term commitment-based safety management and climate for safety	.28	.13	2.17*
Control-based safety management	-.07	.09	-.70
Type of ward (reference category ICUs)			
Medical wards	-.33	.16	-2.00*
Surgical wards	-.28	.18	-1.57
Mixed medical/surgical wards	-.21	.21	-1.00
Type of hospital (reference category top-clinical/UMC)	.05	.11	.44
Number of respondents per ward	-.01	.01	-1.48
Dependent variable model: perceived patient safety: R^2=.50, F(8,83)=10.24***			
Constant	.53	.70	.75
Suggestion-focused voice	.15	.06	2.28*
Commitment-based safety management	.04	.02	1.73
Control-based safety management	.18	.04	4.14***
Type of ward (reference category ICUs)			
Medical wards	-.27	.10	-2.85**
Surgical wards	-.32	.10	-3.11**
Mixed medical/surgical wards	.03	.12	.27
Type of hospital (top-clinical/UMC)	-.10	.06	-1.52
Number of respondents per ward	-.00	.01	-.34

Conditional direct effect of commitment-based safety management on perceived patient safety through suggestion-focused voice

	B	SE	LL 95% CI	UL 95% CI
Climate for safety				
-.21 (-1SD)	.03	.05	-.07	.12
0 (M)	.09	.04	.00	.17
+.21 (+1SD)	.14	.05	.04	.24

Table 5 Regression results for the conditional direct and indirect effects of perceived commitment-based safety management on suggestion-focused voice and perceived patient safety (continued)

Conditional indirect effect of commitment-based safety management on perceived patient safety through suggestion-focused voice				
	B	SE	LL 95% CI	UL 95% CI
Climate for safety				
-.21 (-1SD)	.00	.01	-.01	.04
0 (M)	.01	.01	-.00	.04
+.21 (+1SD)	.02	.01	.00	.05
Index of moderated mediation	.04	.03	-.01	.11

*p<0.05; **p<0.01; ***p<0.001. Unstandardised regression coefficients are reported.
Bootstrap sample size = 5,000. LL = lower limit, CI = confidence interval, UL=upper limit.

DISCUSSION

Constructive suggestions from frontline staff are important for improving (safety) performance (MacKenzie et al., 2011; Maynes & Podsakoff, 2014). Therefore, nurse managers try to encourage nurses' suggestion-focused voice. The current study aimed to explore how nurses' perceptions of control- and commitment-based safety management and climate for safety combine to influence nurses' suggestion-focused voice and their perceptions of the level of patient safety in clinical hospital wards. Results demonstrate that higher levels of nurses' suggestion-focused voice are associated with more positive perceptions of patient safety within the hospital ward. Against our expectations, no direct relationship was found between nurses' perceptions of control-based safety management and the expression of suggestion-focused voice. Neither did we find indications for a moderating role of climate for safety in this relationship. Apparently, high levels of perceived control-based management do not hinder (nor facilitate) nurses' willingness to offer suggestions. When nurses experience that their direct supervisor uses more control-based management practices they tend to evaluate patient safety more positively. However, we did not find support that suggestion-focused voice mediates the relationship between control-based management and perceived patient safety. In contrast, nurses' perceptions of commitment-based safety management are positively related to suggestion-focused voice, although results were only marginally significant. The relationship between commitment-based safety management and suggestion-focused voice is moderated by climate for safety. High levels of perceived commitment-based management do significantly relate to suggestion-focused voice when nurses experience that patient safety is (highly) valued within the ward. Furthermore, our results provide marginal support for the indirect effect of commitment-based safety management on nurses' perceptions

of patient safety within their ward through the expression of suggestion-focused voice. Suggestion-focused voice does mediate the relationship between commitment-based management and perceived patient safety when nurses experience that patient safety is highly valued within their ward.

So far, healthcare research and practice have mainly focused on problem-focused aspects of voice (Okuyama et al., 2014). However, our findings indicate that suggestion-focused voice is important for improving patient safety as well. Both types of voice may contribute differently to patient safety improvement. Healthcare professionals who express their concerns about work practices or behaviours that they consider (potentially) harmful may stimulate that these problems are swiftly corrected and they may instantly prevent patient harm (Morrison, 2011; Okuyama et al., 2014). Suggestion-focused voice is, in contrast, more future-oriented in nature. By offering concrete suggestions for improvement, employees may provide solutions for potential safety risks and possibly prevent that risky situations someday lead to patient safety incidents (Morrison, 2011). Our findings are in line with prior evidence, which suggests that work groups perform better when employees share their ideas and recommendations (Detert et al., 2013; MacKenzie et al., 2011; Maynes & Podsakoff, 2014). After all, organisations may take advantage of the experience-based suggestions from frontline staff. Therefore, nurse managers who want to improve patient safety should not only stimulate healthcare professionals to speak up about patient safety concerns, but also encourage employees to offer constructive suggestions for patient safety improvement.

Our findings suggest that if hospital managers want to encourage suggestion-focused voice – and accordingly improve (the perceived level of) patient safety – they should simultaneously focus on emphasising commitment-based management practices and strengthening the climate for safety. On the one hand, climate could serve as a mediator: leader's actions may influence employees' perceptions of the priority of patient safety, which in turn affect their behaviour, for example in terms of the number of treatment errors being reported (Leroy et al., 2012). On the other hand, climate for safety could act as a contextual moderator (Kuenzi & Schminke, 2009). The current study suggests that climate for safety sets boundary conditions for the association between perceived commitment-based safety management and nurses' suggestion-focused voice. These findings are consistent with Hofmann et al. (2003, p. 175) who described that an *"organizational climate establishes a context that emphasizes certain role behaviours as being important"*. Their research revealed that the positive relationship between high-quality leader-member exchange and the felt responsibility for discretionary safety behaviours (including suggestion-focused voice) was stronger under conditions of a more positive safety climate. So, an organisational climate may provide cues about appropriate safety behaviours and it may signal whether suggestions concerning patient safety are welcomed and likely to be effective (Morrison, 2011). However, the perceived priority of

patient safety is not only influenced by direct supervisors. Higher-level leaders and fellow care providers have a role in shaping a safety climate as well. Physicians are, for example, important role models when it comes to patient safety management (Alingh et al., 2015) and their behaviour may influence nurses' perceptions of the importance of patient safety within the department. Therefore, it is important that patient safety is prioritised at all levels of the organisation. After all, the climate for safety may influence whether the message that nurse managers want to transmit via their safety management approach comes across to their employees and influences employees' suggestion-focused voice.

The present study has some limitations. First, the cross-sectional design does not support causal relations. Theoretical insights provide support for the assumption that management practices influence employee behaviours, which in turn, affect organisational performance (e.g., Guest, 1997). However, additional research using longitudinal data is needed to rule out reverse causality. Furthermore, the response rate for nurses was relatively low, raising questions about representativeness. However, the characteristics of our large sample of nurses do resemble the characteristics of the nursing workforce in Dutch hospitals in general (CBS StatLine, 2016). Third, we exclusively focused on nurse managers and nurses in clinical hospital wards. Future research may test whether our findings hold in other settings and for other occupational groups. Finally, although perceived patient safety is considered to be positively related to actual safety performances (Smeds-Alenius, Tishelman, Lindqvist, Runesdotter, & McHugh, 2016; Stalpers, Kieft, van der Linden, Kaljouw, & Schuurmans, 2016), future research should include more objective patient safety outcome measures.

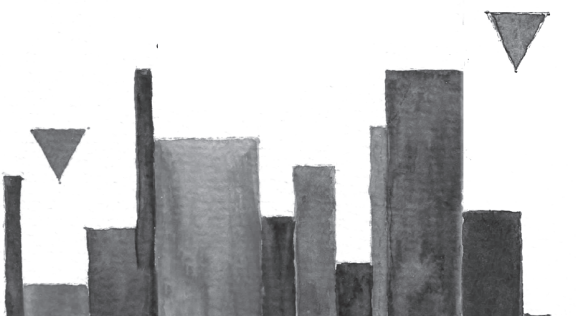
CONCLUSION AND IMPLICATIONS FOR NURSING MANAGEMENT

This study provides some first evidence for the relevance of suggestion-focused voice for (the perceived level of) patient safety, and for the role of nurse managers in stimulating nurses to voice their suggestions for safety improvement in hospitals. Our results indicate that the level of patient safety might improve when employees share their suggestions. Nurses are more willing to offer suggestions if they experience higher levels of commitment-based safety management and at the same time experience that patient safety is (highly) valued. Furthermore, control-based management does not seem to hinder (nor facilitate) nurses' suggestion-focused voice. Thus, if nurse managers want to encourage their nursing staff to come up with suggestions they are advised to clearly prioritise patient safety, exhibit role modelling behaviour, show determination to ensuring safe care delivery, create awareness on safety issues and encourage employees to participate in safety improvement initiatives. The hospital as a whole should take responsibility for prioritising patient safety and creating a climate in which employees consider it worthwhile

to offer suggestions for safety improvement. After all, a positive association between perceived leader behaviour and suggestion-focused voice is only found when nurses experience average or high levels of climate for safety. Furthermore, nurses' perceptions of commitment-based safety management have a positive effect on the perceived patient safety via suggestion-focused voice when nurses experience high levels of climate for safety. So, if nurse managers want to encourage suggestion-focused voice – and accordingly improve (the perceived level of) patient safety – our results indicate that they should simultaneously focus on emphasising commitment-based management practices and strengthening the climate for safety.

Chapter 7

Conclusions and discussion



Healthcare managers together with healthcare professionals have a central role in ensuring safe care delivery in hospitals. Despite broad agreement on the leading role of managers, no clear consensus exists on how to effectively manage patient safety. In the literature, a wide array of leadership behaviours and management practices has been described with regard to patient safety management (e.g., Parand, Dopson, Renz, & Vincent, 2014; Verschueren, Kips, & Euwema, 2013). Some of these practices and behaviours have demonstrated reductions in adverse events or preventable mortality, but scientific evidence on their effectiveness is often inconclusive (Shekelle et al., 2013). Moreover, safety interventions are never implemented in isolation and their chances of success seem to depend largely on the implementation process and their embedding within the organisation (Singer & Vogus, 2013). Furthermore, attention is predominantly given to managers who show commitment, create awareness and generate an intrinsic motivation in employees (Verschueren et al., 2013). Far less attention has been devoted to hospital managers' role in regulating, monitoring and controlling employee behaviour. Although, the latter more control-oriented approach might be important for patient safety management as well, especially at operational level (Flin & Yule, 2004). Therefore, in this study we shifted the focus towards the broader spectrum of leader behaviours and management practices used to ensure safe care delivery. This dissertation aimed to provide insight into how healthcare managers manage patient safety, why they choose a specific safety management approach and how different management approaches affect healthcare professionals' safety-related attitudes and behaviour as well as patient safety performance. In the following section, we will summarise the main findings by answering the research questions. Subsequently, theoretical as well as methodological issues are discussed. Finally, we offer suggestions for future research and recommendations for practice.

CONCLUSIONS

Conceptualising control- and commitment-based safety management

Our first sub-question addressed the conceptualisation of safety management approaches in hospital care. Elements of both control- and commitment-based management are found to be relevant for managing patient safety. Our results demonstrate, however, that the concepts as described in HRM literature (e.g., Arthur, 1994; Walton, 1985) need to be adapted and refined to specifically fit patient safety management in hospital care. During an iterative process, we combined theoretical insights from HRM literature with empirical evidence derived from semi-structured interviews to come to a reconceptualisation of control- and commitment-based safety management. Figure 1 provides an overview of the sub-dimensions of both management approaches that we identified to be relevant for managing patient safety in hospital care.

Sub-dimension	Definition
Control-based safety management	
Stress the importance of safety rules and regulations	A manager stresses the importance of compliance with safety rules and regulations
Monitor compliance	A manager monitors compliance with safety rules and regulations during care delivery and audits, as well as based on registrations in (electronic) patient records
Provide feedback on (non-) compliance	A manager provides employees with either positive or negative feedback on their compliance with safety rules and regulations and uses formal sanction policies in case of recurrent non-compliance
Commitment-based safety management	
Prioritise patient safety	A manager gives priority to delivering safe care and demonstrates this to employees, both in words and deeds
Show commitment on patient safety	A manager shows determination to ensure patient safety by encouraging employees to deliver safe care to patients, coaching workers in safety behaviours and taking improvement initiatives
Show role modelling behaviour	A manager is a role model for employees in regard to patient safety and practises what he/she preaches
Create safety awareness	A manager attempts to increase consciousness of safety issues by making employees aware of the potential safety risks and deficiencies in their own performance
Encourage participation	A manager encourages employees to take initiative on improving patient safety and to participate in decision-making processes on safety issues

Figure 1 Sub-dimensions of control- and commitment-based safety management

A control-based safety management approach focuses on encouraging appropriate safety behaviours by enforcing compliance and controlling employee behaviour. In the case of patient safety management, this approach is first characterised by managers who stress the importance of compliance with detailed clinical guidelines, protocols and checklists. These safety rules and procedures increase the predictability of care delivery, thereby enabling managers to monitor whether healthcare professionals show adequate safety behaviours. The interviews illustrated that managers monitor compliance during care delivery and safety audits, as well as based on registrations in (electronic) patient records. Based on these monitoring results, employees are provided with feedback on their behaviour. Remarkably, respondents mostly reported feedback on non-compliance, while compliments for adequately following safety procedures were hardly mentioned. In line with this, all of the hospitals included in our qualitative research have formal sanction policies for specific safety issues, allowing them to give employees formal reprimands or even to dismiss someone in the case of recurrent non-compliance.

Commitment-based safety management is, in contrast, targeted at strengthening employees' intrinsic motivation for patient safety by showing true dedication and creating awareness on safety issues. Our results demonstrate that this approach is first

characterised by managers who clearly prioritise patient safety over other organisational domains, such as production. Second, managers try to show genuine commitment to safe care delivery. Respondents described, for example, how they recurrently brought patient safety to employees' attention, coached workers in safety behaviours and continuously looked for opportunities to improve patient safety within their unit. Managers seem also well aware that they are important role models when it comes to patient safety management. Managers who 'walk the talk' may demonstrate what kinds of safety behaviours are expected from employees and may encourage employees to imitate these desired behaviours. In addition, commitment-based safety management is found to be characterised by managers who create awareness of potential safety risks and deficiencies in healthcare professionals own performances. To illustrate, managers discuss safety incidents or near misses during team meeting and they report benchmarking results when they compare their safety outcomes with similar units in other hospitals. Finally, we found that managers try to sharpen employees' sense of ownership for patient safety by actively inviting them to make safety recommendations, to question the feasibility of safety initiatives and to apply their medical expertise to safety matters.

Environmental conditions influence the shaping of safety management approaches

Secondly, we were interested in why hospitals choose a specific safety management approach. Therefore, the second sub-question is: how do internal organisational characteristics and external environmental conditions influence the shaping of safety management approaches in hospital care? Our qualitative research demonstrates that the shaping of safety management approaches is strongly influenced by demands from stakeholders in the institutional environment, competitive mechanisms deriving from the healthcare market as well as internal organisational characteristics. Hospitals face, for example, requirements imposed by the Dutch Healthcare Inspectorate, government initiatives or accreditation committees. Furthermore, the shaping of safety management approaches is influenced by professional norms and regulations, pressure from health insurers that negotiate with hospitals on both quality and price and the public opinion on patient safety in hospital care. All studied hospitals try to balance these directives of external stakeholders with the needs of the organisation and the practical experiences of their own employees. We found that managers always combine elements of control- and commitment-based management when it comes to patient safety management. However, variation in the (perceived) external pressure exerted on hospitals as well as internal organisational characteristics does also give rise to considerable variation in the management approaches adopted across hospitals and departments.

By imposing safety requirements and presenting demands for accountability, influential stakeholders in the institutional and competitive environment (e.g., Dutch Healthcare In-

spectorate, government initiatives, accreditation committees and health insurers) mainly steer managers towards a control-based safety management approach. This research revealed that when managers face concrete and practicable safety requirements that are accompanied by tight external supervision and serious consequences when requisites are not met (e.g., sanctions, fall in production, loss of reputation), they generally experience little room to manoeuvre and a pressing need for compliance. As a consequence, managers frequently choose top-down enforcement and strictly monitor and control healthcare professional behaviours. Especially if healthcare professionals seem to lack the intrinsic motivation to follow safety rules or procedures, for example because they question the practical relevance. Furthermore, our findings indicate that demands for accountability (e.g., performance indicators) are often incorporated in hospital's internal planning and control cycle and discussed during periodic appraisal interviews between ward managers and the board of directors. Ward managers are thus held accountable for the safety performances of their department and will, consequently, enforce appropriate safety behaviours of their employees. The extent to which control-based management practices dominate the safety management approach differs: the greater the pressure that a manager faces, the higher the chance that he or she chooses to monitor and control healthcare professional behaviours rather than relying on employees' intrinsic motivation. Especially in the case of a crisis situation (e.g., following sanctions, serious safety incidents) which requires a hospital to rapidly respond and exhibit decisiveness, managers frequently tighten up the safety rules and procedures, closely monitor employee behaviours, and increase feedback and sanction policies.

In contrast, professionals' dedication to ensure patient safety steers managers towards a commitment-based safety management approach. The hospital workforce is characterised by highly educated, autonomous working professionals who are socialised to constantly pursue error-free and safe care delivery. Accordingly, the managers who we interviewed argue that most healthcare professionals are intrinsically motivated for safety behaviours. This intrinsic motivation can be strengthened by the use of commitment-based management practices, such as raising awareness of safety risks and explaining the relevance of safety practices. Therefore, managers frequently choose a commitment-based management approach if externally imposed safety requirements target a clinically relevant issue and are underlined by strong evidence. Furthermore, this study reveals that when managers experience plenty of room to manoeuvre, they do more frequently opt for commitment-based management practices. This is, for example, the case when safety demands are difficult to put into concrete and controllable regulations, or when they require the specific expertise of healthcare professionals to transform them into practicable safety procedures. To illustrate, 'soft skills' such as speaking up behaviour are hard to enforce, therefore managers mostly try to inspire healthcare professionals to voice their safety concerns or suggestions. Finally, this study illustrates that the shaping of

commitment-based management practices is also motivated by personal preferences of managers and influenced by one's position in the managerial hierarchy. Healthcare managers frequently have a professional background themselves and a commitment-based management approach is considered to be more in line with the way professionals typically interact. Thus, our findings indicate that managers generally prefer a commitment-based safety management approach, but external environmental conditions often steer them more towards a control-based management approach.

The ConCom Safety Management Scale

Gaining insight into the effect of different safety management approaches first requires the ability to measure a management approach. Therefore, we developed a questionnaire for healthcare professionals' perceptions of the safety management approaches used by their direct supervisor, using the sub-dimensions of control- and commitment-based management that were identified in our qualitative research (see Figure 1). The newly developed ConCom Safety Management Scale was tested in a sample of 2,378 nurses working in clinical hospital wards. We also tested a second version of the questionnaire, in which direct supervisors themselves report on the management approaches they put into practice. The latter version was tested in a sample of 302 nurse managers. Psychometric properties of both questionnaires were evaluated using confirmatory factor analysis and reliability estimates.

We first tested the questionnaire concerning nurses' perceptions of control- and commitment-based safety management approaches. Our study provides support for the construct validity and the reliability of this ConCom Safety Management Scale. The factor structure revealed three sub-dimensions for control-based safety management: (1) stressing the importance of safety rules and regulations; (2) monitoring compliance; and (3) providing employees with feedback. Commitment-based management consisted of four sub-dimensions: (1) showing role modelling behaviour; (2) creating safety awareness; (3) showing safety commitment; and (4) encouraging participation. Overall, our final model strongly resembles our theoretical model: only the sub-dimensions 'Prioritise patient safety' and 'Show role modelling behaviour' were found to be one rather than two separate factors. The final 33-item questionnaire showed acceptable goodness-of-fit indices. Construct validity of the scale was further supported by high factor loadings. Our findings suggest that control- and commitment-based safety management are two distinct yet related constructs. The reliability coefficients of the management approaches as well as most of the sub-dimensions (see Table 1) well exceeded the generally accepted criterion of 0.70 for acceptable reliability (Nunnally, 1978). The results did also provide initial evidence that the measurement instrument has the ability to detect variation in nurses' perceptions of the safety management approaches adopted by nurse managers at different departments and to a slightly lesser extent between hospitals. Considerable

congruence was found in the scores of nurses working at the same clinical ward. Findings on the construct validity and reliability were reconfirmed in a cross-validation procedure, providing support for scale stability (DeVellis, 2012).

Table 1 Sub-dimensions of the ConCom Safety Management Scale

	Nurses		Nurse managers	
Sub-dimensions	Items (N)	α	Items (N)	α
Control-based safety management		**.79**		**.72**
Stress the importance of safety rules and regulations	5	.70	5	.60
Monitor compliance	4	.59	4	.56
Feedback on (non-) compliance	3	.64	3	.47
Commitment-based safety management		**.94**		**.82**
Role modelling behaviour	7	.90	5	.56
Create safety awareness	6	.86	6	.77
Leader's safety commitment	5	.90	5	.80
Encourage participation	3	.82	3	.70

Subsequently, we tested the questionnaire in which nurse managers themselves report on the safety management approaches they put into practice. Two items were dropped from the sub-dimension 'Role modelling behaviour' in the initial commitment-based management scale because of high risks of socially desirable answers. Confirmatory factor analysis provided support for the construct validity of the scale measured among nurse managers. Furthermore, although relatively low reliability estimates were found for some of the subscales, acceptable reliability coefficients were found for both manager-rated control- and commitment-based safety management approaches (see Table 1).

In conclusion, our findings support the construct validity of the ConCom Safety Management Scale measured among nurses as well as nurse managers. For both groups of respondents a similar factor structure was found, consisting of seven sub-dimensions that were allocated to either control- or commitment-based safety management; although two items were dropped from the manager version of the questionnaire. Relatively low reliability estimates were found for some of the sub-dimensions (predominantly in the control-based management scale), but the internal consistency of both control- and commitment-based safety management measured among nurses as well as nurse managers were found to be acceptable.

Control- and commitment-based safety management both contribute to healthcare professionals' safety-related attitudes and behaviour

The fourth sub-question addressed the effect of different safety management approaches on healthcare professionals' safety attitudes and behaviour. Our findings indicate that control- and commitment-based safety management both in their own way contribute to healthcare professionals' safety-related attitudes and voice behaviours.

First, positive associations were found between nurses' perceptions of control-based safety management and climate for safety, and between the perceived level of commitment-based management and team psychological safety. If nurses experience that their direct supervisor stresses the importance of safety rules, monitors compliance and provides them with feedback, they consider patient safety to be highly valued. Nurses who perceive that their direct supervisor shows commitment and role modelling behaviour, creates awareness and encourages employees to participate, perceive the environment to be psychologically safe for taking interpersonal risks. Remarkably, we did not find a statistically significant association between commitment-based safety management and climate for safety, neither did we find any indication for a negative relationship between control-based management and team psychological safety.

Furthermore, our findings indicate that if nurses experience high levels of commitment-based safety management they are more willing to engage in problem-focused as well as suggestion-focused voice; although a positive association was only found under certain conditions or indirectly via a mediating variable. The positive relationship between nurses' perceptions of commitment-based management and their willingness to speak up about patient safety concerns is found to be fully mediated by team psychological safety. Thus when nurses experience that their direct supervisor uses more commitment-based management practices, they feel psychologically safer and are, consequently, more willing to take the risks of engaging in problem-focused voice. The positive relationship between nurse-rated commitment-based management and suggestion-focused voice is, in turn, found to be moderated by climate for safety. In other words, high levels of perceived commitment-based management do only significantly relate to suggestion-focused voice when nurses experience that patient safety is (highly) valued within their department. The latter requires managers to use control-based management practices, since healthcare professionals' perceptions of control-based management are positively related to a climate for safety. Our findings do, however, not show a direct or indirect relationship between nurses' perceptions of control-based safety management and their willingness to engage in problem- or suggestion-focused voice. Control-based safety management does not seem to hinder nor facilitate nurses to speak up about safety concerns or to offer suggestions for patient safety improvement.

Role of safety management approaches in ensuring patient safety

At last, we explored the relationship between nurses' perceptions of control- and commitment-based safety management and the perceived level of patient safety within their ward. Results of this study provide support for a positive association between nurses' perceptions of the control-based safety management practices of their direct supervisor and the level of patient safety within the clinical ward. When nurses experience that their direct supervisor stresses the importance of safety rules, monitors compliance and provides them with feedback they tend to evaluate the level of patient safety more positively. No direct relationship was found between nurse-rated commitment-based safety management and nurses' perceptions of the level of patient safety. However, we found indications for an indirect effect of commitment-based safety management on nurses' perceptions of patient safety within the department through the expression of suggestion-focused voice, but only if nurses experience that patient safety is highly valued within their department.

THEORETICAL REFLECTIONS

The main findings of this dissertation reveal different themes that will be discussed in more detail in the following paragraphs. First, we elaborate on the multidimensional nature of control- and commitment-based safety management, followed by the contextualisation of the safety management approaches of nurse managers. Subsequently, the regulatory style of external stakeholders is discussed. Furthermore, a plea is made for reappraising a control-based approach when it comes to managing patient safety. Finally, we discuss the role of nurse managers in safety management.

Safety management requires a multidimensional approach

The findings of this study indicate that patient safety management is a multidimensional construct, consisting of two separate but closely related approaches towards workforce management: control- and commitment-based safety management. The multidimensional character of safety management implies that both management approaches could be adopted independently at the same time. In theory, managers can exclusively focus on either control- or commitment-based management practices. However, in practice all of the studied nurse managers combined elements of both approaches when it comes to patient safety management. This in contrast to a generally accepted thought in HRM literature that organisations primarily rely on either one of the management approaches (Walton, 1985). According to HRM scholars, control- and commitment-based management reflect two radically different views on employee motivation that form the two opposite extremes of a management spectrum (e.g., Arthur, 1994; Walton, 1985). Co-existence of both

approaches might be inevitable during the transitional stage from a traditional control-oriented towards a commitment-based management approach, but is overall considered to be undesirable (Khatri, Baveja, Boren, & Mammo, 2006; Walton, 1985). According to Khatri and colleagues simultaneously adopting elements of both approaches would even result in *"an unstable and inconsistent management approach"* (Khatri et al., 2006, p. 134) which forms a source of confusion for employees. However, our research does not provide any indication for such negative effects in hospitals. It appears that nurse managers consider control- and commitment-based management approaches to be complementary rather than mutually exclusive when it comes to patient safety management. For example, in the case of hospital-acquired infections, nurse managers point out healthcare professionals' role in infection prevention, they create awareness by discussing infection rates, focus attention on relevant safety protocols and procedures, monitor compliance and, simultaneously, set a good example by showing appropriate safety behaviours. Thus in order to prevent hospital-acquired infections, nurse managers adopt control-based management practices in synergy with elements of a commitment-based safety management approach. So in healthcare practice, the management approaches are often intertwined to ensure patient safety. However, results of our factor analysis demonstrate that control- and commitment-based safety management should still be seen as two separate dimensions rather than one broader management approach. Thus, conceptually control- and commitment-based safety management are framed as two separate management approaches that combine into a multidimensional safety management construct. As shown in Figure 2, this multidimensional safety management construct could take any possible combination of control- and commitment-based management practices. Nurse managers could, for example, choose to emphasise commitment-based management practices and combine these with varying levels of a control-based safety management approach. In other situations, managers may prefer to emphasise control-based safety management, or they could choose to balance both management approaches by simultaneously adopting comparable levels of control- and commitment-based management practices.

Contextualising control- and commitment-based safety management

How control- and commitment-based safety management combine varies among hierarchical levels, between different situations as well as over time. Nurse managers' choice to emphasise either one of the approaches, intensively use both control- and commitment-based management practices or (temporarily) put little effort in patient safety management is dependent on contextual features as well as the individual agency shown by a manager (i.e., does the manager have a personal drive to work on patient safety, feel responsible and dare to take a risk by deviating from external safety requirements). Accordingly, we found that the multidimensional safety management approach adopted by a nurse manager varies from situation to situation.

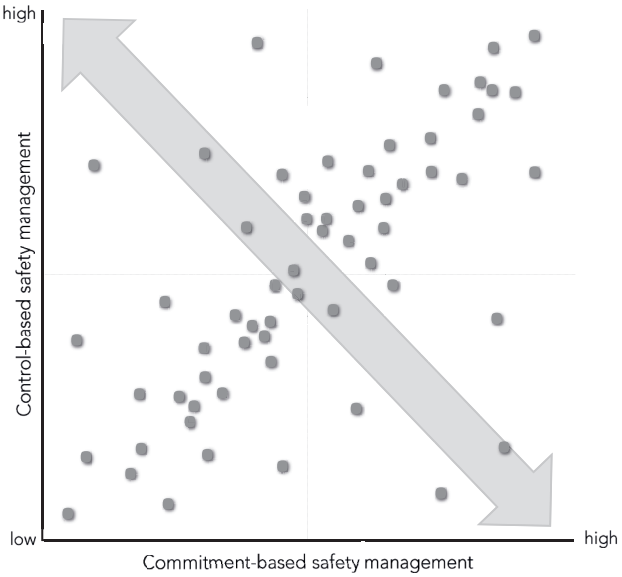


Figure 2 Multidimensional safety management construct
Note: The double arrow represents the theoretical continuum of control- and commitment-based management approaches, whereas the dots stand for the multidimensional safety management approach which could take any possible combination of control- and commitment-based management practices.

Our results indicate that managers at strategic (hospital) level frequently choose to adopt a basis of control-based safety management, whereas nurse managers at operational (ward) level prefer to lay a foundation of commitment-based management practices (see Figure 3). Higher-level managers generally experience greater pressure for public accountability and compliance with the demands from external stakeholders than do their colleagues at operational level. Consequently, they lay emphasis on internal planning and control cycles to monitor whether the imposed safety demands are met and they provide operational managers with feedback. On top of the control-based foundation, higher-level managers often incorporate commitment-based management practices. However, the level of commitment-based management varies considerably, depending on the priority given to patient safety versus other organisational issues and the individual agency shown by a manager. In contrast, nurse managers at operational level generally prefer to adopt a sound basis of a commitment-based safety management approach. These nurse managers frequently have a nursing background themselves and a commitment-based approach is considered to be more in line with the way professionals usually interact (Khatri et al., 2006). On top of the commitment-based foundation, nurse managers use control-based management practices. We found that their choice for control-based safety management is dictated by top-down imposed control mechanisms that seep through the organisation as well as the urgency of safety issues and the motiva-

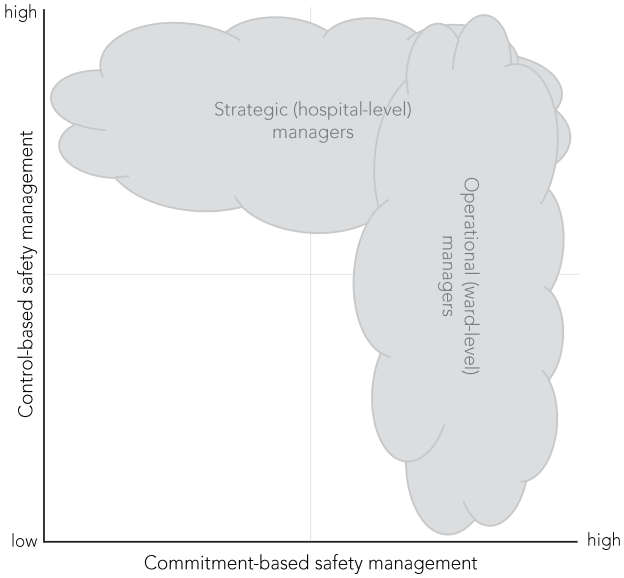


Figure 3 Hierarchical variation in safety management approaches

tion and self-regulating abilities of a manager's subordinates. In line with this, the shaping of the safety management approaches varies among (types of) clinical departments.

Apart from hierarchical differences, the multidimensional safety management approach adopted by nurse managers is found to vary between situations. In fact, managers' choice to give emphasis to control- or commitment-based management practices is not a black-and-white issue. Specific contextual features, characteristics of the safety issues at hand, personal preferences and individual agency shown by nurse managers are all found to influence the shaping of a safety management approach (see Figure 4). Accordingly, a management approach is always customised. Management practices that work in one situation are not necessarily effective in another case; as previously demonstrated in organisational behaviour (Johns, 2006; Johns, 2017), HRM (Paauwe & Farndale, 2017) and patient safety literature (Taylor et al., 2011). According to HRM scholars (Arthur, 1994; Khatri et al., 2006; Walton, 1985), a commitment-based management approach would be best suited to manage complex and ambiguous safety issues in the context of highly-skilled, intrinsically motivated and autonomous working healthcare professionals. However, our results show a more nuanced view. Although nurse managers do indeed reveal a natural tendency towards a commitment-based approach, some situations simply require the use of control-based management practices. This is especially the case when managers want to highlight the critical importance of specific safety issues or behaviours and when they do not have full confidence in the intrinsic motivation of healthcare professionals to naturally show this behaviour. The importance of enforcing particular safety behaviours

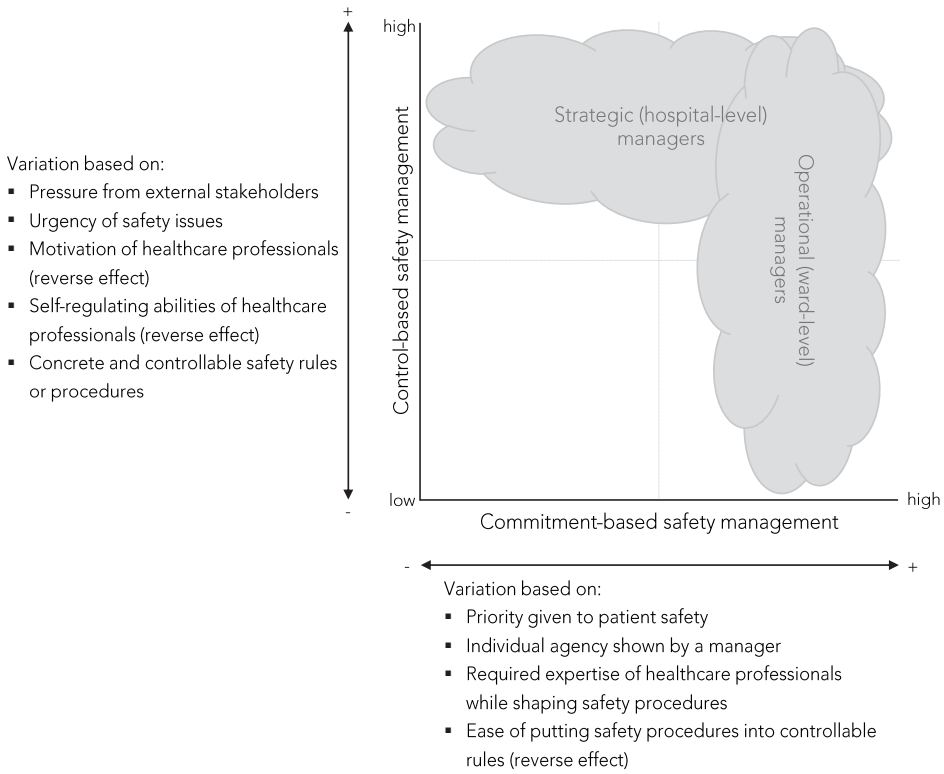


Figure 4 Contextualising a multidimensional safety management approach

may arise from evidence on its effectiveness in ensuring patient safety, the urgency of safety issues (e.g., following a safety incident), or top-down or externally imposed requirements and demands for accountability. However, it should be noticed that adopting a control-based management approach first requires that the relevant safety behaviours are put into concrete and controllable rules or regulations. Despite evidence on its effectiveness (Kirkland et al., 2012), proper hand hygiene is for example still not self-evident in many hospitals (Erasmus et al., 2010). In order to motivate appropriate hand hygiene practices, nurse managers increasingly spell out relevant protocols, monitor hand washing, provide employees with feedback and impose sanctions. Nevertheless, our results show that control-based safety management is always complemented by elements of a commitment-based approach, such as creating awareness of the relevance of hand hygiene for reducing infection rates. Furthermore, when nurses have a strong intrinsic motivation for hand hygiene compliance, nurse managers do not necessarily have to adopt a control-based approach. In that case, emphasising commitment-based safety management practices might be enough to ensure appropriate safety behaviours. If nurses are intrinsically motivated and demonstrate great self-regulating abilities, manag-

ers might even (temporarily) keep both control- and commitment-based management approaches to a minimum. So, equivalent to the situational leadership approach which shows that managers should adjust their leadership style to the level of competence and the commitment of their subordinates (Northouse, 2013), our results suggest that nurse managers should align their choice to emphasise control- or commitment-based management practices with the importance and urgency of safety issues as well as the level of intrinsic motivation (or commitment) of the nurses whom they supervise.

Responsive regulation should trigger both control- and commitment-based safety management

Our results reveal that the safety requirements and demands for accountability from external stakeholders mostly trigger managers to adopt control-based management practices, they hardly give rise to a commitment-based safety management approach. Preferably, the external stakeholders stimulate the use of both management approaches by combining and alternately emphasising different regulatory mechanisms, depending on the importance of the safety issues at hand and the faith placed in the self-regulation abilities of a hospital. This is in line with Healy & Braithwaite (2006) who argued that regulation mechanisms should be responsive to the context and the culture of those being regulated. Hence, variation in regulatory styles might occur over time, between hospitals and even among the departments within a single hospital. The 'regulatory pyramid' recommends regulators to start with trust in the self-regulation capacities of a hospital or department and to escalate into stricter forms of enforcement when safety requirements are not met (Healy & Braithwaite, 2006). In other words, external stakeholders should deliberately target their regulatory style to the specific situation they face. If necessary strictly enforcing compliance, if possible offering managers more leeway; consequently giving rise to both control- and commitment-based safety management approaches. For example, when patient safety is not sufficiently guaranteed a department can temporarily be confronted with extra (unannounced) inspections or stringent supervision, whereas regulators could rely more on an organisations' self-regulating abilities when a department recently received positive evaluations. Remarkably, most of the managers who we interviewed during our qualitative research did not clearly differentiate between the pressures exerted by different stakeholders in the institutional and competitive environment. In fact, they lumped together the majority of the external pressures under the same heading and typically perceived these as prescriptive, mistrusting and compliance-oriented. Although regulation in Dutch healthcare does indeed mostly focus on enforcing compliance, recently some new regulatory initiatives were introduced which offer more room to manoeuvre for hospital managers. For example, the Dutch Healthcare Inspectorate started experimenting with process-oriented or governance-based regulation which focuses on the inspection of a hospital's governance system for patient

safety (and care quality) rather than meeting predefined safety standards (Stoopendaal, de Bree, & Robben, 2016). Compared with traditional compliance-oriented regulatory styles, this initiative placed more emphasis on self-organisation, self-critical reflection and the autonomy of participating hospitals (Stoopendaal & van de Bovenkamp, 2015). Consequently, governance-based regulation offers managers more room to manoeuvre and, correspondingly, more possibilities for emphasising a commitment-based safety management approach. The Dutch Healthcare Inspectorate recently expressed the ambition of *"finding the right balance between trust and sanctioning"* (Dutch Healthcare Inspectorate, 2016, p. 16). It would be desirable that other external stakeholders follow this line of reasoning and specifically target their regulatory style at the specific situation they face, consequently giving rise to both control- and commitment-based safety management practices.

Reappraising a control-based management approach

Findings of this study indicate that control-based management should be reappraised when it comes to managing patient safety. A control-based approach carries a negative connotation, both in practice and the literature. In the public debate, managerial control is frequently associated with 'ticking the boxes' and requirements that lay down an administrative burden (Meurs, 2014; [Ont]regel de Zorg, 2018). Our conceptualisation of control-based safety management focuses instead on behavioural safety directives that give healthcare professionals instructions on how to deliver safe patient care. According to the literature, these directives and managerial control would be demoralising and impede safety improvement (Khatri et al., 2006). Therefore, HRM scholars highlighted the need to shift away from a traditional control-oriented approach towards commitment-based management practices (Khatri et al., 2006; Walton, 1985). However, our findings indicate that both management approaches in their own way contribute to nurses' safety-related attitudes and behaviour. Nurses interpret control-based safety management as a reflection of the importance of (certain) patient safety (behaviours) rather than a sign of distrust. Hence, we make a plea for reappraising a control-based approach when it comes to patient safety management. Nurse managers' choice for a control-based approach is found to be motivated by managers' sincere concerns about patient safety and their willingness to facilitate safe care delivery. On top of that, nurse managers feel forced to adopt control-based management practices because of top-down or externally imposed safety requirements. Thus, the choice for control-based safety management is mainly patient-oriented or externally induced. This in contrast with assumptions in the literature that control-based management primarily originates from distrust in the self-regulation capacities of employees (Khatri et al., 2006) and the felt need to establish order and exercise control (Walton, 1985). Despite the importance of control-based safety management, nurse managers are still seeking for the best way to shape a control-based management

approach. First, nurse managers do not always feel comfortable about exercising managerial control. Control-based management does not naturally align with the autonomy and self-regulating abilities of healthcare professionals (Freidson, 2001; Numerato, Salvatore, & Fattore, 2012), neither with the caring and compassionate personality traits of nurses (Eley, Eley, Bertello, & Rogers-Clark, 2012; Williams, Dean, & Williams, 2009). As one of the interviewed nurse managers said: *"I don't want to be a police officer."* This may also clarify why control-based management practices are always combined with elements of a commitment-based approach. Second, control-based management may be hard to put into practice. Nurse managers cannot always observe the one-to-one situation in which a nurse takes care of her patient and management information on compliance is frequently not (real-time) available in the (electronic) patient record. Moreover, deliberate non-compliance can sometimes be the right thing to do in order to ensure a patient's safety. These findings might also explain the relatively low internal consistency of the control-based safety management subscales. For example, respondents' interpretation of the statement *"When we repeatedly do not comply with safety rules or procedures, disciplinary actions will be taken"* (item of the 'Provide feedback on (non-) compliance' subscale) is not necessarily obvious. After all, nurses could (and should) break the rules when they have good reasons to do so. How nurses interpret control-based safety management is, among other things, dependent on the level of ambiguity or strength of the message communicated by the management practices (Bowen & Ostroff, 2004), the quality of the communication by the nurse manager (Den Hartog, Boon, Verburg, & Croon, 2013) and the attributions that nurses make about *why* their manager implements a control-based approach (Nishii, Lepak, & Schneider, 2008). It seems to matter *"whether control is viewed as communicating restrictions and limits or whether it is seen as communicating valuable information"* (Speklé, van Elten, & Widener, 2017, p. 74). We found that control-based safety management is typically interpreted by nurses as signalling the importance of patient safety issues. A (partial) explanation for this might be that control-based management practices are often embedded in a commitment-based management approach, which could soften the message communicated by the control-based practices. So, even though nurse managers do not always feel comfortable about exercising managerial control, control-based safety management is found to make a valuable contribution to managing patient safety.

Nurse managers provide an important link in the safety management chain

Growing evidence points to the leading role of (nurse) managers in ensuring patient safety (Parand et al., 2014; Verschueren et al., 2013). Our findings indicate that nurse managers do indeed have a central role in shaping nurses' safety-related attitudes and behaviour, yet they represent just one (important) link in the safety management chain. Nurse managers are well able to set the right tone in order to motivate their nursing

staff for patient safety and to overcome professionals' resistance because most of these managers are so-called professional-managerial hybrids: nursing *"professionals engaged in managing professional work, professional colleagues, and other staff"* (McGivern, Currie, Ferlie, Fitzgerald, & Waring, 2015, p. 412). Their hybrid role enables nurse managers to view patient safety issues through a 'two-way window' and to align the professional and managerial discourses (Llewellyn, 2001). Consequently, they are in a strong position to influence nurses' safety-related attitudes and behaviour. However, nurses' attitudes and behaviour are not only influenced by the management approach of their direct supervisor. Characteristics of the individual employee, the team and the broader work environment play an important role as well (e.g., Morrison, 2014; Nembhard, Labao, & Savage, 2015; Newman, Donohue, & Eva, 2017). To illustrate, results of our qualitative study show that higher-level managers, medical managers and informal leaders have a role in managing patient safety as well; stressing the importance of so-called distributed management (Bolden, 2011). In line with this, Taylor and colleagues (2015) demonstrated that high performing hospitals stand out by committed and supportive managers across all organisational levels, from the board room to the bedside. Higher-level managers who emphasise the priority of patient safety and create conditions favourable for delivering safe care may, for example, contribute to developing a safety climate (Singer & Tucker, 2014), encouraging quality improvement (Jones et al., 2017) and enhancing patient safety performance (Jiang, Lockee, Bass, Fraser, & Norwood, 2009). Furthermore, physicians have a crucial role and powerful voice in patient safety management, both in formal managerial roles and as informal leaders or role models during clinical practice (Berghout, Fabbricotti, Buljac-Samardžić, & Hilders, 2017). The latter is also referred to as *"managing beyond the manager"* (Mintzberg, 2011, p. 147) and is considered particularly relevant in organisations employing a highly professionalised workforce and in case of complex problems for which professionals themselves have a great responsibility (McKee, Charles, Dixon-Woods, Willars, & Martin, 2013), such as patient safety. Our qualitative research demonstrated that leading physicians are important role models when it comes to patient safety management. In day-to-day interactions, prominent healthcare professionals may lead by example, draw attention to safety matters and convince their colleagues to act the same. Furthermore, in line with the self-regulation tradition that characterises medical professionals (Freidson, 2001), in some hospitals managerial control is partially replaced by professional control. In these hospitals, nurses or other healthcare professionals play a central role in monitoring each other's behaviour and providing co-workers with feedback on (non-) compliance. The distributed formal and informal responsibilities for patient safety management do, however, not downgrade the position of nurse managers. After all, our results indicate that nurse managers have a significant role in stressing the priority of patient safety, creating a work environment in which nurses feel psychologically safe and stimulating employee behaviour.

METHODOLOGICAL REFLECTIONS

This dissertation is one of the first studies to thoroughly examine control- and commitment-based management approaches in the context of patient safety management in hospital care. By combining qualitative and quantitative methodologies in an exploratory sequential mixed methods approach we obtained considerable insight into the safety management approaches used by (nurse) managers as well as the effects of different management approaches on healthcare professionals' safety attitudes, behaviour and patient safety performance. Based on our qualitative study, we adapted the conceptualisations of control- and commitment-based management approaches such that they specifically target patient safety management in hospital care. Subsequently, these conceptualisations were used to develop the ConCom Safety Management Scale to enable the measurement of (nurses' perceptions of) both management approaches in the context of nurse managers in clinical hospital wards. Psychometric properties of the newly developed questionnaire were tested thoroughly and provided support for the construct validity and the reliability of the scale. Finally, a large sample of nurses and nurse managers proved willing to participate in our survey study. As a result, our findings provide unique insight into patient safety management in nursing care in clinical hospital wards. However, despite these strengths, some limitations should be taken into account while interpreting the results.

First, our cross-sectional research design only demonstrates associations between the safety management approaches and nurses' attitudes, behaviour and patient safety performance. It did not allow us to test causality. As a result, the findings of the last two chapters need to be interpreted with some caution. Even though all of the relationships tested in these studies were theoretically underpinned by thorough literature review, we cannot rule out reverse causality. After all, shaping safety management is potentially a reciprocal process. It is theoretically plausible that the (perceived) safety management approaches influence nurses' attitudes and behaviour, but nurses' attitudinal and behavioural reactions could also influence the shaping of the management practices adopted by a nurse manager. In order to draw conclusions on the causal order of the relationships between the different variables, we could have collected longitudinal data or conducted a case control study. However, the prior is hard to put into practice because of environmental dynamics in healthcare – and more specifically patient safety management – and the latter might raise ethical questions.

Second, both our qualitative and quantitative datasets were used to write multiple empirical papers. Overusing a single dataset for more than one paper is increasingly criticised (Chen, 2011). However, it is deemed possible if every paper makes a unique contribution *"with respect to the research question, theories used, constructs / variables included, and the theoretical and managerial implications"* (Kirkman & Chen, 2011, p.

437). We undertook large-scale qualitative and quantitative studies, both of which covered multiple unique – although related – research questions that were underpinned by various theoretical approaches. However, the variables and data used to answer the research questions overlapped to some extent. For example, data about control- and commitment-based safety management was first divided into two subsamples which were used to develop and test the ConCom Safety Management Scale (chapter 4) and subsequently the data was included in the analyses of the chapters 5 and 6 as an independent variable. Hence, the evidence presented in these chapters is not completely independent. Our findings might be influenced by (unknown) extraneous factors specific to our sample. We could have increased the validity of our results and drawn stronger, more reliable conclusions if we would have been able to replicate our findings in a second, independent sample of nurses and nurse managers.

A third limitation of this study is the lack of objective outcome measures. In the end, we are interested how control- and commitment-based safety management contribute to ensuring patient safety. However, objective patient safety performance indicators are often difficult to measure and not always comparable across hospital wards and hospitals (Vincent, 2010). Staff perceptions of the level of patient safety are considered a useful substitute because they are found to align with more objective safety indicators (Lawton et al., 2015; Smeds-Alenius, Tishelman, Lindqvist, Runesdotter, & McHugh, 2016; Stalpers, Kieft, van der Linden, Kaljouw, & Schuurmans, 2016). Furthermore so-called proximal attitudinal or behavioural measures are more directly influenced by a nurse manager's safety management approach (Guest, 1997). We tried to obtain a fairly objective score for nurses' behaviour by using nurse manager ratings of nurses' suggestion-focused voice. However, these ratings reflect group- rather than individual-level behaviour. Our study would have benefited from including scores for individual nurses' actual safety behaviour. Furthermore, the nature of (part of) the attitudinal and behavioural measures dictated the use of nurses' self-reported ratings. After all, nurses' attitudes towards the climate for safety, team psychological safety and their intentions towards speaking up can only be reported by nurses themselves. As a consequence, our analyses are partly based on same source data. Hence, the validity of some of the conclusions might be threatened by common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). We tried to reduce the likelihood of common method bias by preventing conceptual overlap in the items belonging to the different constructs, presenting information on the construct validity of the measures being used (Conway & Lance, 2010), guaranteeing respondents anonymity and assuring them that there were no right or wrong answers (Podsakoff et al., 2003).

A fourth limitation of this study concerns the broad focus on patient safety management. In the interviews as well as surveys, we asked respondents about (their perceptions of) the *overall* safety management approach adopted within a clinical ward or hospital. However, the findings of our qualitative study indicate that the safety management

approaches vary among situations. We did not take this variation into account during the quantitative phase of our research. On the one hand, the broad focus may provide an accurate reflection of how nurses and nurse managers perceive the overall safety management approach. On the other hand, a more narrow focus on managing specific safety issues or behaviours could possibly have shown more variation in the management approaches between hospital wards.

Finally, we mostly focused on nurse managers and nurses in clinical hospital wards. This focus limits the generalisability of our findings to different occupational groups (e.g., physicians) or different settings (e.g., outpatients clinic, long-term care). However, as mentioned in the individual chapters, the level of generalisability will vary. Firstly, our qualitative research indicates that our conceptualisation of control- and commitment-based safety management is not only relevant for nurse managers at operational level, but also for managers higher up in the hospital hierarchy. However, the specific management practices that managers adopt are found to vary. Since we exclusively focused on Dutch hospitals, the generalisability of our conceptualisation to other healthcare settings may be low. Specific situational features will lead to modifications in the safety management approach adopted. Yet in essence, we expect that both management approaches have the potential to be relevant for managing patient safety in other settings as well. Secondly, it is questionable whether the ConCom Safety Management Scale is generalisable outside the context of nurses and nurse managers in clinical hospital wards. Our sample provided a fair reflection of the population of Dutch hospital nurses and their nurse managers, supporting the generalisability of our results to these populations. However, applying the questionnaire to different occupational groups or in other healthcare settings may require reframing of the items. Physicians may, for example, not always identify with a direct supervisor. Furthermore, *"nursing as a profession is culturally more amenable to management"* (Turner, Ramsay, & Fulop, 2013, p. 540) than are physicians. Consequently, variation is to be expected in the (strength of the) relationships between the safety management approaches and healthcare professionals' safety-related attitudes and behaviour. Therefore, future research is needed to examine whether the results of our quantitative studies presented in chapters 5 and 6 will hold in different occupational groups or settings.

RECOMMENDATIONS FOR FUTURE RESEARCH

The findings of this study give rise to a number of themes that are relevant for future research on patient safety management.

One of the central questions of nurse managers concerning patient safety management is: How can I stimulate appropriate safety behaviours in employees and, accordingly, en-

sure patient safety within my department? The current study already provided insight into the associations between control- and commitment-based safety management, nurses' attitudes, voice behaviour and their perceptions of the level of patient safety within a hospital ward. However, these outcomes cover just some aspects of the broad range of behaviours and performance measures that are relevant to patient safety. Future research is needed to deepen our understanding how control- and commitment-based management practices combine to influence different kinds of safety-related attitudes and behaviours. Stimulating compliance with safety rules and regulations (e.g., concerning hand hygiene or patient identification) may possibly require a different safety management approach than motivating nurses for soft skills such as voicing safety concerns or suggestions. Furthermore, it is interesting to explore whether the influence of the safety management approaches compares across occupational groups (e.g., nurses, physicians, paramedics). In addition, future research should focus on how control- and commitment-based safety management approaches can be used to tackle specific patient safety problems. The required safety management approach may vary depending on the complexity, ambiguity or predictability of safety risks. Ideally, research would results in a roadmap for managers which reveals the most appropriate safety management approach for specific patient safety issues and how this approach should vary depending on situational factors as well as over time.

Secondly, nurse managers do not manage patient safety in isolation. Our findings illustrate that a variety of managers in formal managerial positions, informal leaders and external stakeholders is involved in patient safety management. Future research is needed to gain insight into how the system as a whole contributes to ensuring patient safety. In other words, the focus should shift from the influence of an individual (nurse) manager to the combined effect of anyone who is involved in patient safety management. After all, the message spread by the management practices or behaviour of a single formal or informal leader is possibly strengthened if it aligns with the management approach adopted by other actors within the system, otherwise the message could be weakened.

Thirdly, future research is needed on how hospitals as well as individual healthcare professionals could be stimulated to proactively deal with safety risks. Our results indicate that some hospitals are primarily concerned with conformity to external safety requirements. In other words, their safety culture is bogged down in a calculative stage rather than maturing into a proactive or generative safety culture in which *"patient safety constitutes an integral component of the working lives of everyone in the organization"* (Hoffmann & Rohe, 2010, p. 94). However, dynamics in healthcare require both care providers and managers to constantly signal potential safety threats and to come up with solutions to mitigate these risks. After all, safety risks might change and new threats could emerge from, among other things, the growing complexity of care delivery and the rapidly changing technical possibilities. As a consequence, patient safety management should evolve

as well. Therefore, future research should focus on how such a proactive or generative safety culture could be stimulated at all organisational levels. For example, what stimuli or incentives could external stakeholders use to trigger hospitals to take initiative in improving patient safety? And how could organisational conditions and the safety management approaches adopted by managers at various hospital levels be favourable for encouraging proactive safety behaviours in healthcare professionals?

RECOMMENDATIONS FOR PRACTICE

The results of this study lead to various recommendations concerning patient safety management for nurse managers, higher-level managers, informal leaders as well as different external stakeholders.

Nurse managers

Based on the findings of this study, nurse managers are advised to combine control- and commitment-based management practices with regard to patient safety management and to adjust their safety management approach to the specific situation they are facing. Nurse managers should be aware of the variation in impact of control- and commitment-based safety management and the different purposes that both management approaches can serve. They must align their management approach with the importance and urgency of safety issues and the level of intrinsic motivation of the nurses whom they supervise. Furthermore, it is important that nurse managers keep in mind that the 'actual' management approach that they implement may be perceived differently by their nursing staff. Therefore, nurse managers are advised to further explicate their safety management approach and to clearly communicate with their nurses in order to ensure that their message comes across. For example, nurse managers could discuss particular monitoring results during staff meetings and explain to their nursing staff how they observed the specific compliance behaviours. On the one hand this will provide nurses with insight into what their manager does to ensure patient safety, on the other hand it will provide understanding of what safety behaviours are expected from employees.

That every nurse manager should be able to properly use and effectively combine control- and commitment-based safety management has consequences for the recruitment and training of nurse managers. Hospital managers are advised to select nurse managers, among other things, based on their ability to effectively switch and easily balance control- and commitment-based management practices. Furthermore, hospitals might offer their nurse managers training and on-the-job coaching in *how* and *when* both safety management approaches could be best put into practice. By practicing the use of control- and commitment-based management approaches in training settings or dur-

ing simulations, nurse managers can familiarise themselves with the complete range of relevant safety management practices. As a result, they will probably more easily adopt management practices that they do not naturally prefer to use. Furthermore, peer-to-peer and on-the-job coaching could provide nurse managers with guidance on *when* to emphasise a control- or commitment-based safety management approach. By sharing concrete experiences and discussing practical recommendations for safety management, nurse managers will learn how to manage particular safety issues in specific situations. On top of these local training and coaching programmes, interaction and knowledge exchange among nurse managers across different hospitals could be stimulated in order to further improve patient safety management. For example, by organising professional education about patient safety management or nursing management more in general.

The leading role of nurse managers in managing patient safety in hospital wards pleads for strengthening nurse managers' position within the hospital and further professionalising nursing management. Currently, nurse managers are often not closely involved in shaping hospital-wide safety policies and procedures. However, their responsibility for stimulating appropriate safety behaviour in nurses – who form a significant part of the hospital staff and who have an important role in ensuring safe care delivery – would certainly justify a more central role in patient safety management. This might require an overall professionalisation of nursing management. Most nurse managers are socialised into the nursing domain and act more like a 'primus inter pares' rather than explicitly profiling themselves as (nurse) managers. On the one hand this enhances their credibility among the nursing staff, on the other hand it could weaken their position in the managerial hierarchy. Just like higher-level managers, nurse managers might professionalise their work *"by establishing occupational standards […] through educational programmes, journals, conferences and codes of conduct"* (Noordegraaf & van der Meulen, 2008, p. 1055). Educational institutions may, for example, initiate (post-) graduate programmes especially targeted at nursing management at operational level, in which nurse managers are taught how to ensure appropriate (safety) behaviours in their employees. After all, stimulating and facilitating employees to deliver the safest, best possible care to all of their patients is one of the core businesses of every nurse manager.

Higher-level managers and informal leaders

Higher-level managers should be aware of the role they have in shaping patient safety management through the strategic choices they make and by setting an example for managers at lower organisational levels. Rather than passively conforming to externally imposed safety requirements, higher-level managers should take an active role in determining a hospital's strategic direction regarding patient safety management. It is important that managers are aware of the room to manoeuvre available as well as their own role in emphasising control- and commitment-based safety management approaches.

Just like nurse managers, higher-level managers should create a proper balance between both management approaches, depending on the specific situational features. On the one hand emphasising internal planning and control cycles to monitor compliance with (externally imposed) safety demands and to provide healthcare professionals or operational managers with feedback, on the other hand creating awareness of safety issues and showing genuine commitment to ensuring patient safety. Although members of the board of directors, business unit managers and medical managers mostly work at strategic or tactical hospital levels, they must realise that their safety management approach is often clearly visible and might directly influence healthcare professionals' safety-related attitudes and behaviour. Moreover, the management approach used by higher-level managers might seep through the organisation and influence lower-level managers' choice for control- or commitment-based management practices. Therefore, it is important that higher-level managers constantly focus on shaping the appropriate safety management approach, also when other issues distract their attention. Furthermore, direct involvement of managers in various positions requires close collaboration in order to ensure that employees get unambiguous messages of what is expected of them when it comes to ensuring patient safety.

Patient safety management is not just the responsibility of managers in formal managerial positions, informal leaders have an important role in ensuring patient safety as well. Leading professionals are considered credible messengers who can act as role models, draw attention to safety issues, explain safety interventions to their colleagues and stimulate compliance and appropriate safety behaviours. In fact, every single healthcare professional should take his or her responsibility for patient safety management. On a small scale, professionals can already make a contribution by constantly prioritising patient safety in day-to-day care delivery, speaking up about safety concerns or offering suggestions for safety improvement. Furthermore, they could stimulate appropriate safety behaviours among colleagues by creating awareness of safety issues or providing co-workers with feedback when they observe that safety rules or regulations are not closely followed. The latter may occur on an informal basis during the teamwork of healthcare employees, but it could also be incorporated more formally if healthcare professionals take responsibility for a specific safety protocol and stimulate co-workers to follow those safety rules. This professional control might, however, require specific knowledge and skills of employees and may, consequently, influence what competencies need to be taught during the initial training of healthcare professionals. It first requires that healthcare professionals gather sound knowledge about (how to mitigate) patient safety risks. Moreover, healthcare professionals need to learn how to provide colleagues with constructive feedback and how to motivate their peers to exhibit appropriate safety behaviours. Furthermore, professionals' role in safety management would require a change in the *"culturally ingrained reluctance to correct an erring colleague"* (Leistikow, Kalkman, & de Bruijn, 2011). Every healthcare

professional should shoulder the professional responsibility to discuss potential safety threats and to motivate co-workers for safety behaviours, no matter hierarchical differences or seniority. Healthcare professionals must realise that ensuring patient safety is a *shared* responsibility of everyone who is involved in care delivery.

Regulatory agencies and health insurers

A variety of external stakeholders could influence the shaping of a hospital's safety management approach. Our recommendations will focus on those stakeholders that the respondents in our qualitative study considered most influential: regulatory agencies and health insurers.

Regulatory agencies are advised to strictly enforce compliance if necessary and to offer managers more leeway whenever possible; consequently giving rise to both control- and commitment-based safety management approaches. Results of our study indicate that demands for accountability and safety requirements of influential external stakeholders such as the Dutch Healthcare Inspectorate and accreditation committees are frequently perceived as prescriptive and compliance-oriented by hospital managers. However, not all safety issues require a command and control style of regulation. Depending on the importance and the urgency of safety issues, and the faith placed in the self-regulating abilities of a hospital, external stakeholders could also choose to offer managers more room to manoeuvre. For example, they are advised to adopt reflexive styles of regulation and focus on how hospitals govern patient safety rather than monitoring whether hospitals meet predefined performance standards. By doing so, regulatory agencies stimulate a more proactive role of hospitals and better use the existing professional and managerial expertise on patient safety management to its full potential. Hence, external stakeholders should find a proper balance in their regulatory styles. However, achieving such a balance does also require that regulatory agencies are given sufficient latitude in customising their regulatory style and that media and politicians do not reflexively demand stricter regulation of patient safety in response to (serious) safety incidents.

Furthermore, health insurers should not mimic the role of regulatory agencies but instead focus on providing financial, purchasing incentives to stimulate hospitals to walk the extra mile when it concerns patient (safety) outcomes and the added value of health care delivery. Our findings indicate that managers frequently place health insurers under the same umbrella as regulatory agencies: both groups of stakeholders are perceived as issuing demands for accountability for (minimum) patient safety requirements. Although insurers need to gain insight into the (minimum) level of patient safety to determine whether or not to purchase good quality healthcare, they could also stimulate hospitals to go beyond minimum performance standards by incorporating agreements on patient safety in their purchasing contracts. Regarding the former, health insurers are advised to align their safety indicators with those used by regulatory agencies in order to reduce

the administrative burden for hospitals. Concerning the latter, health insurers could for example negotiate agreements on specific safety issues that a hospital should focus on, or they could provide hospitals with (financial) incentives when they reach certain safety performances.

Finally, it is recommended that regulatory agencies as well as health insurers shift their focus from input or process indicators towards (patient safety) outcome indicators as a basis for external accountability over patient safety. The current focus on input or process indicators provides managers with rigid instructions about what is expected of them in terms of (protocols for) patient safety. Such standards could be beneficial for reducing simple patient safety risks, but they are not suitable for minimising uncertain of ambiguous risks involved in care delivery. Moreover, the focus on input or process indicators primarily gives rise to a control-based safety management approach and frequently leads to a compliance mentality of 'ticking the boxes' without internalising and actively thinking through the patient safety risks and the underlying mechanisms. Outcome indicators could offer managers more leeway to deal with safety risks and, concurrently, generate an intrinsic safety motivation in employees. After all, all healthcare professionals want to provide safe care of good quality to all of their patients and they generally consider outcome indicators to give valuable information about the quality of care being delivered. Moreover, outcome indicators do more naturally lead to the use of a commitment-based safety management approach. Insight into patient safety outcomes could make employees aware of the potential safety risks and deficiencies in their own performance and, accordingly, generate commitment on patient safety issues as well as appropriate safety behaviours.

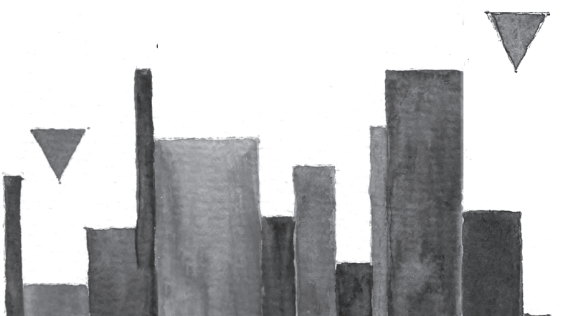
CONCLUDING REMARKS: RETHINK YOUR CASE

This dissertation highlights the importance of both control- and commitment-based management approaches for managing patient safety in hospital care. Looking back at the case of Mr Jansen which we presented in the introduction, nurse managers could craft various combinations of control- and commitment-based management to prevent reoccurrence of such an adverse event. Managers could respond to the incident by tightening up protocols or guidelines on how to take care of patients on clinical suspicion of stroke. They can also use the case to create awareness of safety risks from brief moments of inattention or a lack of speaking up behaviour and interdisciplinary teamwork. Given the coherence and the varying purposes that both safety management approaches serve, it is important that nurse managers know *how* to combine control- and commitment-based management practices and *when* to adopt a specific combination of these approaches. Hospitals face the challenge to continuously improve patient safety and to foster a culture

in which the organisation is not primarily concerned with reactive follow-up to safety incidents or external safety requirements, but proactively deals with potential safety risks. Achieving such improvements requires constant efforts of nurse managers, but it is also a shared responsibility which requires true dedication of all healthcare professionals, higher-level managers and relevant external stakeholders. Just like healthcare professionals swear that they will not harm their patients during care delivery (KNMG, 2004), so should managers and external stakeholders assure that they will constantly seek the right balance between control- and commitment-based management approaches to effectively manage patient safety.

Appendix

The ConCom Safety Management Scale



CONDITIONS OF USE OF THE CONCOM SAFETY MANAGEMENT SCALE

Students and scientific researchers are welcomed to use both the employee and the manager version of the ConCom Safety Management Scale on the condition that:

- The ConCom Safety Management Scale will be used for non-commercial, educational and research purposes only (meaning that no one is charging anyone a fee for use of the scale).
- The user distributes the questionnaire to a sample of a maximum of 250 respondents. If the ConCom Safety Management Scale will be distributed to a sample of over 250 respondents, a copyright fee might be charged.
- The user analyses the data following the scoring instructions given in:
  Alingh, C. W., Strating, M. M. H., van Wijngaarden, J. D. H., Paauwe, J., & Huijsman, R. (2018). The ConCom Safety Management Scale: Developing and testing a measurement instrument for control-based and commitment-based safety management approaches in hospitals. *BMJ Quality & Safety*. Advance online publication. doi:10.1136/bmjqs-2017-007162
- In publications, the following reference will be made to the ConCom Safety Management Scale:
  Alingh, C. W., Strating, M. M. H., van Wijngaarden, J. D. H., Paauwe, J., & Huijsman, R. (2018). The ConCom Safety Management Scale: Developing and testing a measurement instrument for control-based and commitment-based safety management approaches in hospitals. *BMJ Quality & Safety*. Advance online publication. doi:10.1136/bmjqs-2017-007162
- The user will send a copy of publications in which (part of) the ConCom Safety Management Scale is used to concomscale@eshpm.eur.nl.
- The user will share the data collected using the ConCom Safety Management Scale on request.
- If the user translates the ConCom Safety Management Scale in any other language than Dutch of English, the user will send a copy of the translated questionnaire to concomscale@eshpm.eur.nl.

EMPLOYEE VERSION OF THE CONCOM SAFETY MANAGEMENT SCALE

Please keep in mind the nurse manager who supervises you in your clinical department, while answering the following questions.

The first set of items is answered on a scale ranging from 'definitely false' to 'definitely true'.

	definitely false	mostly false	mostly true	definitely true
In this department, it is considered extremely important to follow safety rules and procedures (e.g., regarding hand hygiene)	1	2	3	4
In this department, people can ignore formal safety rules and procedures if it helps to get the job done	1	2	3	4
In this department, everything has to be done by the book	1	2	3	4
In this department, it is not necessary to follow safety rules and procedures to the letter	1	2	3	4
In this department, nobody gets too upset if people break safety rules and procedures	1	2	3	4

The following items are answered on a scale ranging from 'never' to 'always'.

	never	rarely	sometimes	often	always
My supervisor provides continuous encouragement to do our jobs safely	1	2	3	4	5
We are informed about errors that happen in this department	1	2	3	4	5
We compare our patient outcomes with results of other departments, and results of this benchmark are discussed	1	2	3	4	5
We are generally informed about the patient outcomes available for our department	1	2	3	4	5
When my supervisor is in the department, he/she monitors whether we comply with safety rules and procedures (e.g., regarding hand hygiene)	1	2	3	4	5
My supervisor spends time showing me the safest way to do things at work	1	2	3	4	5
My supervisor shows determination to maintain a work environment where we deliver safe care to our patients	1	2	3	4	5
In this department, employees' compliance with safety rules and procedures is monitored on a regular basis, for example during safety audits or walk rounds	1	2	3	4	5
We are given feedback about changes put into place based on event reports	1	2	3	4	5
My supervisor behaves in a way that displays a commitment to patient safety	1	2	3	4	5
Whether we comply with safety rules is monitored based on information registered in (electronic) patient records (e.g., information regarding pressure ulcers, pain, frail elderly)	1	2	3	4	5

In this department, we discuss ways to prevent errors from happening again	1	2	3	4	5
My supervisor suggests new ways of doing our jobs more safely	1	2	3	4	5
In this department, it is rarely monitored whether employees comply with safety rules and procedures	1	2	3	4	5
In this department, performance indicators for patient safety (e.g., pressure ulcers, hospital acquired infections) are discussed	1	2	3	4	5

The last set of items is answered on a scale ranging from 'completely disagree' to 'completely agree'.

	completely disagree	disagree	neither agree or disagree	agree	completely agree
My supervisor overlooks patient safety problems that happen over and over	1	2	3	4	5
My supervisor always practises the safety protocols he/she preaches	1	2	3	4	5
Regarding safety, my supervisor delivers the consequences he/she describes	1	2	3	4	5
My supervisor seriously considers staff suggestions for improving patient safety	1	2	3	4	5
Whenever pressure builds up, my supervisor wants us to work faster, even if it means taking shortcuts	1	2	3	4	5
In my department, anyone who violates safety rules or procedures is swiftly corrected	1	2	3	4	5
Regarding safety, my supervisor's words do not match his/her deeds	1	2	3	4	5
My supervisor encourages me to express my ideas and suggestions regarding patient safety improvement	1	2	3	4	5
When we repeatedly do not comply with safety rules or procedures, disciplinary actions will be taken	1	2	3	4	5
The actions of my supervisor show that patient safety is a top priority	1	2	3	4	5
My supervisor encourages us to take initiative on improving patient safety whenever it is possible	1	2	3	4	5
My supervisor does not actually prioritise safety issues as highly as he/she says he/she does	1	2	3	4	5
Compliance with safety rules and procedures (e.g., regarding hand hygiene) does substantially contribute to a positive assessment in our department	1	2	3	4	5

MANAGER VERSION OF THE CONCOM SAFETY MANAGEMENT SCALE

Please keep in mind the clinical department for which you are the nurse manager, while answering the following questions.

The first set of items is answered on a scale ranging from 'definitely false' to 'definitely true'.

	definitely false	mostly false	mostly true	definitely true
In this department, it is considered extremely important to follow safety rules and procedures (e.g., regarding hand hygiene)	1	2	3	4
In this department, people can ignore formal safety rules and procedures if it helps to get the job done	1	2	3	4
In this department, everything has to be done by the book	1	2	3	4
In this department, it is not necessary to follow safety rules and procedures to the letter	1	2	3	4
In this department, nobody gets too upset if people break safety rules and procedures	1	2	3	4

The following items are answered on a scale ranging from 'never' to 'always'.

	never	rarely	sometimes	often	always
I provide continuous encouragement how employees can do their jobs safely	1	2	3	4	5
I inform employees about errors that happen in this department	1	2	3	4	5
We compare our patient outcomes with results of other departments, and results of this benchmark are discussed	1	2	3	4	5
I do generally inform employees about the patient outcomes available for our department	1	2	3	4	5
When I am in the department, I monitor whether employees comply with safety rules and procedures (e.g., regarding hand hygiene)	1	2	3	4	5
I spend time showing employees the safest way to do things at work	1	2	3	4	5
I show determination to maintain a work environment where employees deliver safe care to their patients	1	2	3	4	5
In this department, employees' compliance with safety rules and procedures is monitored on a regular basis, for example during safety audits or walk rounds	1	2	3	4	5
Employees receive feedback about changes put into place based on event reports	1	2	3	4	5
I behave in a way that displays a commitment to patient safety	1	2	3	4	5
Whether employees comply with safety rules is monitored based on information registered in (electronic) patient records (e.g., information regarding pressure ulcers, pain, frail elderly)	1	2	3	4	5

In this department, we discuss ways to prevent errors from happening again	1	2	3	4	5
I suggest new ways of doing employees' job more safely	1	2	3	4	5
In this department, it is rarely monitored whether employees comply with safety rules and procedures	1	2	3	4	5
In this department, performance indicators for patient safety (e.g., pressure ulcers, hospital acquired infections) are discussed	1	2	3	4	5

The last set of items is answered on a scale ranging from 'completely disagree' to 'completely agree'.

	completely disagree	disagree	neither agree or disagree	agree	completely agree
I overlook patient safety problems that happen over and over	1	2	3	4	5
I always practice the safety protocols that I preach	1	2	3	4	5
Regarding safety, I deliver the consequences that I describe	1	2	3	4	5
I seriously consider staff suggestions for improving patient safety	1	2	3	4	5
Whenever pressure builds up, I want employees to work faster, even if it means taking shortcuts	1	2	3	4	5
In my department, anyone who violates safety rules or procedures is swiftly corrected	1	2	3	4	5
I encourage employees to express their ideas and suggestions regarding patient safety improvement	1	2	3	4	5
When employees repeatedly do not comply with safety rules or procedures, disciplinary actions will be taken	1	2	3	4	5
My actions show that patient safety is a top priority	1	2	3	4	5
I encourage employees to take initiative on improving patient safety whenever it is possible	1	2	3	4	5
Compliance with safety rules and procedures (e.g., regarding hand hygiene) does substantially contribute to a positive assessment in this department	1	2	3	4	5

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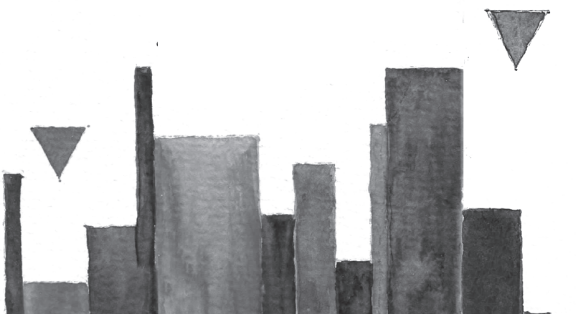

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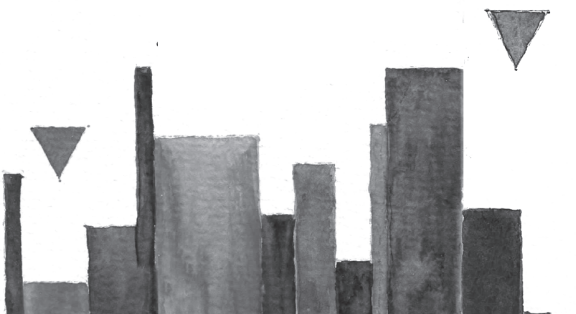
Summary



Healthcare professionals bear a great responsibility for delivering high-quality, safe care to all of their patients. However, care professionals are not the only ones who have an important role in ensuring patient safety, so do healthcare managers. Managers may, for example, contribute to patient safety by creating a climate in which patient safety is highly valued and employees feel safe to express themselves, by encouraging or enforcing appropriate safety behaviours, and by providing the necessary resources to deliver safe care. Over the last two decades several studies have shown that it is not self-evident that hospitalised patients are safeguarded from (preventable) adverse events that cause temporary or permanent harm to them. Notwithstanding the widely agreed necessity to improve the safety in care delivery, no clear consensus exists on how to effectively manage patient safety. So far, attention is predominantly given to managers who show commitment, create awareness and generate an intrinsic motivation in employees. Far less attention has been devoted to managers' role in regulating, monitoring and controlling employee behaviour. Although, the latter more control-oriented approach might be important for patient safety management as well, especially at operational level. Therefore, in this study we shift the focus towards the broader spectrum of leader behaviours and management practices used to ensure safe care delivery. This dissertation aims to provide insight into how hospital managers manage patient safety, why they choose a specific safety management approach and how different management approaches affect healthcare professionals' safety-related attitudes and behaviour as well as patient safety performance.

To answer the research questions, both qualitative and quantitative research methods were used. First, a qualitative study was conducted to gain insight into *how* hospitals manage patient safety (chapter 2) and *why* they choose a specific safety management approach (chapter 3). To obtain a broad overview of safety management in hospital care, a total of 45 interviews were conducted with 50 respondents who have a central role in safety management in five Dutch hospitals (some interviews were duo-interviews). The respondents included members of the board of directors, medical managers, safety managers, business unit managers and nurse managers. **Chapter 2** describes the conceptualisation of the safety management approaches in hospitals. Human resource management (HRM) broadly distinguishes two management approaches that guide employee behaviours: control- and commitment-based management. Our results demonstrate that these management approaches are also relevant for patient safety management. In a control-based safety management approach, managers stress the importance of following safety rules, monitor compliance and provide employees with feedback. In a commitment-based safety management approach, managers clearly prioritise patient safety by exhibiting role modelling behaviour, they show determination to ensuring safe care delivery, encourage employees to participate in safety improvement initiatives and create awareness on

safety issues. Whereas the HRM literature describes that organisations focus on either control- or commitment-based management, our results demonstrate that hospitals combine elements of both management approaches. At strategic level, all hospitals included in chapter 2 utilise a foundation of control-based management to manage patient safety and, on top of that, use elements of commitment-based management. It appears that hospitals consider control- and commitment-based management to be complementary rather than mutually exclusive. There is, however, considerable variation between hospitals: some hospitals almost exclusively focus on control-based management, whereas other hospitals adopt more elements of a commitment-based approach. In addition, the results identify that the combination of management approaches varies within hospitals (e.g., depending on differences in the departments, management positions or job categories), as well as over time (e.g., depending on crisis situations and circumstances that distract hospital's attention from patient safety).

In **Chapter 3**, we focus in more detail on *why* hospitals choose a specific safety management approach. Using a heuristic framework, based on the contextually based human resource theory, we analysed how internal organisational characteristics and external environmental conditions influence the shaping of safety management approaches in hospital care. The results show that the choices made while shaping safety management are strongly influenced by demands from stakeholders in the wider institutional environment and increasingly affected by competitive mechanisms deriving from the healthcare market. The dominant coalition tends to prefer a control-based approach when they experience little room to manoeuvre and expect healthcare professionals to lack intrinsic motivation. Thus, if hospitals face concrete and practicable safety requirements of which the clinical relevance is questioned by healthcare professionals, but that are accompanied by tight supervision and serious consequences if the requisites are not met, direct supervisors frequently monitor and control healthcare professional behaviours. In contrast, the adoption of a commitment-based management approach is generally chosen if the dominant coalition expects safety requirements to generate intrinsic motivation in healthcare professionals or when they experience plenty of room to manoeuvre. Thus, if hospitals experience clinically relevant safety requirements or abstract requisites that are difficult to put into concrete and controllable regulations or which require the specific expertise of healthcare professionals to transform them into practicable safety procedures, supervisors mostly focus on raising awareness of safety risks, explaining the relevance of safety practices and stimulating participation of healthcare professionals. The experienced room to manoeuvre is also influenced by the motivation and individual agency of the dominant coalition. Hospitals that take their own initiative in formulating and reshaping their safety management approaches are often those that experience leeway and in which members of the dominant coalition play a proactive role in prioritis-

ing patient safety. The occurrence of safety incidents or near misses can be an important trigger for this strategic response. So, our results show that institutional and competitive conditions as well as strategic choices that hospitals make result in various combinations of control- and commitment-based safety management. Currently, external pressures frequently lead to the adoption of control-based management. A more balanced approach requires that external stakeholders specifically target their regulatory style at the specific situation they face: if necessary strictly enforcing compliance, whenever possible offering managers more leeway.

The second part of this dissertation is based on a cross-sectional survey study conducted among nurses and nurse managers working in clinical hospital wards. The quantitative phase of our research focuses on how different safety management approaches affect healthcare professionals' safety-related attitudes, behaviours and patient safety performance. A total of 11,809 nurses working in the clinical departments of 17 Dutch hospitals as well as their 712 direct supervisors (i.e., nurse managers) were invited to complete a questionnaire. **Chapter 4** describes the development and testing of the ConCom Safety Management Scale, a measurement instrument for control- and commitment-based safety management approaches of nurse managers in clinical hospital wards. The conceptualisations of control- and commitment-based safety management presented in chapter 2 formed the basis for developing the questionnaire. Per sub-dimension of the management approaches, a set of three to six survey items was developed, addressing nurses' perceptions of the management practices and leadership behaviours shown by their nurse managers. The newly developed questionnaire was tested in a sample of 2,378 nurses working in the clinical wards of the participating hospitals. To test the psychometric properties of the instrument, the final sample was randomly divided into two subsamples: one sample (N=1,165) was used to test and revise our initial structural model; the second sample (N=1,213) was used in a cross-validation procedure. Psychometric properties were evaluated using confirmatory factor analysis and reliability estimates. The findings support construct validity and reliability of the ConCom Safety Management Scale. Our final model consists of seven sub-dimensions that were allocated to either control- or commitment-based safety management. Control-based safety management consists of three sub-dimensions: (1) stressing the importance of safety rules and regulations; (2) monitoring compliance; and (3) providing employees with feedback. Commitment-based management consists of four sub-dimensions: (1) showing role modelling behaviour; (2) creating safety awareness; (3) showing safety commitment; and (4) encouraging participation. Construct validity of the scale is supported by high factor loadings and provides preliminary evidence that control- and commitment-based safety management are two distinct yet related constructs. The final 33-item ConCom Safety Management Scale shows acceptable goodness-of-fit indices and internal consistency (Cronbach's α

of the subscales ranges 0.59-0.90). The findings were reconfirmed in a cross-validation procedure.

Subsequently, Chapters 5 and 6 aim to gain insight into the influence of control- and commitment-based safety management on healthcare professionals' safety-related attitudes, behaviour and patient safety performance. Chapter 5 addresses the relationships between control- and commitment-based safety management, climate for safety, psychological safety and nurses' willingness to speak up in clinical hospital wards. Speaking up is important for patient safety, but prior research has shown that healthcare professionals often hesitate to voice their safety concerns. Direct supervisors could have an important role in stimulating voice behaviour. However, good insight into the relationship between managers' behaviour and employees' perceptions about whether speaking up is safe and worthwhile is still lacking. Our study resulted in a sample of 980 nurses and 93 of their direct supervisors (i.e., the nurse managers of the clinical wards). The nurse managers rated the safety management approach they put into practice. Nurses answered questions on the perceived safety management approach of their direct supervisor, the climate for safety, psychological safety and their speaking up intentions. To test our hypotheses, paired-samples t-tests, hierarchical regression analyses (at ward level) and multilevel regression analyses were conducted. Our results reveal a divergence between nurses' and managers' perceptions of the safety management approaches that managers put into practice: nurse managers say they do more on safety management than what is actually perceived by nurses. Nurses are possibly not always aware of everything their manager does with regard to patient safety management. If nurses perceive that their nurse manager stresses the importance of safety rules, monitors compliance and provides them with feedback (i.e., control-based safety management), they consider patient safety to be highly valued (climate for safety). Nurses who perceive that their direct supervisor shows commitment and role modelling behaviour, creates awareness and encourages them to participate (i.e., commitment-based safety management), perceive the environment to be psychologically safe for taking interpersonal risks. Team psychological safety is found to be positively related to nurses' willingness to speak up. Furthermore, the relationship between nurse-perceived commitment-based safety management and speaking up attitudes is found to be fully mediated by team psychological safety. So, both control- and commitment-based management approaches seem to be relevant for managing patient safety, but when it comes to encouraging speaking up a commitment-based safety management approach seems to be most valuable.

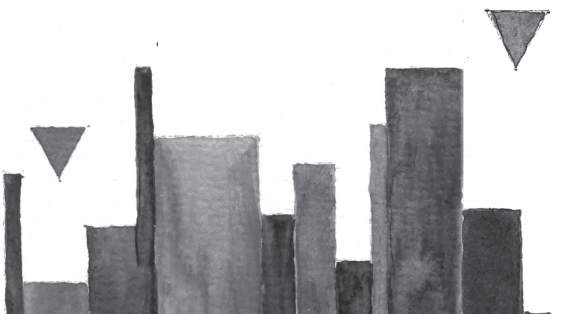
Chapter 6 focuses, in turn, on nurse managers' role in stimulating nurses' suggestion-focused voice. Nurses are considered essential actors in safety improvement in healthcare because their work provides them with valuable insights into safety concerns as well as

solutions. However, little is known about how nurse managers can encourage suggestion-focused voice, neither about the influence of the broader work environment including the climate for safety. Therefore, chapter 6 aims to provide insight into how control- and commitment-based safety management and climate for safety combine to influence nurses' suggestion-focused voice and the perceived patient safety. The hypotheses were tested in a sample of 957 nurses and 92 nurse managers. Nurses answered questions about the perceived safety management approaches of their direct supervisor (i.e., the nurse manager of their ward), the climate for safety and the level of patient safety within their ward. Nurse managers assessed suggestion-focused voice of the nurses whom they supervise. The hypotheses were tested using the PROCESS module of Hayes. All of the analyses were conducted at ward level. Results demonstrate that higher levels of nurses' suggestion-focused voice are associated with more positive perceptions of patient safety within the hospital ward. No direct relationship is found between nurses' perceptions of control-based safety management and the expression of suggestion-focused voice. Neither did we find indications for a moderating role of climate for safety in this relationship. Apparently, high levels of perceived control-based management do not hinder (nor facilitate) nurses' willingness to offer suggestions. When nurses experience that their direct supervisor uses more control-based management practices they tend to evaluate patient safety more positively. In contrast, nurses' perceptions of commitment-based safety management are positively related to suggestion-focused voice, although results were only marginally significant. The relationship between commitment-based safety management and suggestion-focused voice is moderated by climate for safety. High levels of perceived commitment-based management do significantly relate to suggestion-focused voice when nurses experience that patient safety is (highly) valued within the ward. Furthermore, our results provide marginal support for the indirect effect of commitment-based safety management on nurses' perceptions of patient safety within their ward through the expression of suggestion-focused voice. Suggestion-focused voice does mediate the relationship between commitment-based management and perceived patient safety when nurses experience that patient safety is highly valued within their ward. So, if nurse managers want to encourage suggestion-focused voice – and accordingly improve (the perceived level of) patient safety – our results indicate that they should simultaneously focus on emphasising commitment-based management practices and strengthening the climate for safety.

Finally, in the general discussion in **Chapter 7** the main findings of this dissertation are presented and discussed. This dissertation concludes that patient safety management is a multidimensional construct, consisting of two separate but closely related approaches towards workforce management: control- and commitment-based safety management. The multidimensional construct could take any possible combination of control- and

commitment-based management practices. How both management approaches combine varies among hierarchical levels and between different situations. Our results show that managers at strategic (hospital) level frequently choose to adopt a basis of control-based safety management, whereas nurse managers at operational (ward) level prefer to lay a foundation of commitment-based management practices. However, managers' choice to give emphasis to control- or commitment-based management practices is not so much a black-and-white issue. Specific contextual features, characteristics of the safety issues at hand, personal preferences and individual agency shown by nurse managers are all found to influence the shaping of a safety management approach. Nurse managers are advised to align their management approach with the importance and urgency of safety issues as well as the level of intrinsic motivation of the nurses whom they supervise. In line with this, we discussed the role of external stakeholders who should preferably stimulate the use of both management approaches by combining and alternately emphasising different regulatory mechanisms, depending on the situation they face. Furthermore, our findings show that both management approaches in their own way contribute to nurses' safety-related attitudes and behaviour. Therefore, we make a plea for reappraising a control-based approach when it comes to patient safety management. In contrast with the negative connotation that control-based management carries both in practice and the literature, we found that nurses interpret control-based safety management as a reflection of the importance of patient safety rather than a sign of distrust. Based on this study, we conclude that nurse managers have a central role in shaping nurses' safety-related attitudes and behaviour. Yet nurse managers represent just one (important) link in the safety management chain and have to collaborate with higher-level managers, medical managers and informal leaders who have a role in managing patient safety as well. Thus, safety management requires synergies at all levels: synergy of the safety management approaches, synergy of the various formal and informal leaders in hospitals, and synergy of all of the internal and external stakeholders involved in patient safety management.

Samenvatting



Zorgverleners ervaren een grote verantwoordelijkheid voor het leveren van kwalitatief hoogwaardige en veilige zorg aan alle patiënten. Zij zijn echter niet de enige die een belangrijke rol spelen bij het waarborgen van de patiëntveiligheid, dat geldt ook voor zorgmanagers. Managers kunnen bijvoorbeeld bijdragen aan de veiligheid van patiënten door een klimaat te creëren waar patiëntveiligheid hoog in het vaandel staat en waar werknemers zich veilig voelen om elkaar aan te spreken. Ook kunnen managers zorgverleners stimuleren om gewenst veiligheidsgedrag te tonen, kunnen zij dit gedrag zo nodig afdwingen en de middelen verstrekken die nodig zijn om veilige zorg te kunnen leveren. In de afgelopen twee decennia hebben verschillende onderzoeken laten zien dat het niet vanzelfsprekend is dat patiënten die in het ziekenhuis worden opgenomen gevrijwaard blijven van (vermijdbare) incidenten die hen tijdelijke of permanente schade toebrengen. Ondanks dat velen het eens zijn over de noodzaak om de patiëntveiligheid te verbeteren, bestaat er geen consensus over hoe patiëntveiligheid het best gemanaged kan worden. In onderzoek naar veiligheidsmanagement lag de focus tot nu toe vooral op managers die commitment tonen, bewustzijn creëren en de intrinsieke motivatie van medewerkers stimuleren. Er is veel minder aandacht voor de rol van managers bij het reguleren, monitoren en controleren van het gedrag van medewerkers. Een dergelijke meer op controle gerichte managementbenadering kan echter belangrijk zijn voor veiligheidsmanagement, vooral op operationeel niveau. Daarom verleggen we in dit onderzoek de focus naar het bredere spectrum van leiderschapsgedrag en managementpraktijken die worden gebruikt om de patiëntveiligheid te bevorderen. Dit proefschrift heeft tot doel om inzicht te krijgen in hoe managers in ziekenhuizen patiëntveiligheid managen, waarom zij voor een specifieke veiligheidsmanagementbenadering kiezen en hoe verschillende managementbenaderingen de attitudes en het gedrag van zorgprofessionals alsmede de patiëntveiligheid beïnvloeden.

Om de onderzoeksvragen te beantwoorden, werden zowel kwalitatieve als kwantitatieve onderzoeksmethoden gebruikt. Eerst werd een kwalitatief onderzoek uitgevoerd om inzicht te krijgen in de vraag hoe managers in ziekenhuizen patiëntveiligheid managen (hoofdstuk 2) en waarom ze voor een specifieke veiligheidsmanagementbenadering kiezen (hoofdstuk 3). Om een goed beeld te krijgen van het gebruik van veiligheidsmanagement in ziekenhuizen zijn in totaal 45 interviews uitgevoerd met 50 respondenten die een centrale rol hebben in veiligheidsmanagement in vijf Nederlandse ziekenhuizen (sommige interviews waren duo-interviews). De respondenten waren leden van de raad van bestuur, medisch managers, kwaliteits-/veiligheidsmanagers, bedrijfskundig managers en verpleegkundig managers. **Hoofdstuk 2** beschrijft de conceptualisering van de veiligheidsmanagementbenaderingen zoals deze binnen de ziekenhuizen worden gebruikt. In Human Resource Management (HRM) wordt in grote lijnen onderscheid gemaakt tussen twee managementbenaderingen waarmee het gedrag van werknemers ge-

stuurd kan worden: een benadering gebaseerd op controle (*control-based* management) en een benadering gebaseerd op het bevorderen van commitment (*commitment-based* management). Onze resultaten tonen aan dat beide managementbenaderingen ook relevant zijn voor veiligheidsmanagement. In een *control-based* managementbenadering benadrukken managers dat het belangrijk is om (veiligheids-)regels op te volgen, monitoren zij de naleving van deze regels en geven zij medewerkers op basis daarvan feedback. In een *commitment-based* benadering geven managers duidelijk prioriteit aan patiëntveiligheid (bijvoorbeeld door voorbeeldgedrag), tonen zij zich vastberaden om de patiëntveiligheid te waarborgen, moedigen ze werknemers aan om deel te nemen aan verbeterinitiatieven en creëren ze bewustwording voor veiligheidsissues. Terwijl de HRM-literatuur veronderstelt dat organisaties zich richten op een *control-based* óf een *commitment-based* benadering, laten onze resultaten zien dat ziekenhuizen elementen van beide managementbenaderingen combineren. Alle ziekenhuizen die deelnamen aan het in hoofdstuk 2 beschreven onderzoek, gebruiken op strategisch niveau een basis van *control-based* management en voegen daar (in wisselende mate) elementen van een *commitment-based* benadering aan toe. Het lijkt er op dat ziekenhuizen *control-based* en *commitment-based* managementbenaderingen als complementair beschouwen in plaats van dat beide benaderingen elkaar uitsluiten. We vinden echter aanzienlijke variatie tussen ziekenhuizen: sommige ziekenhuizen richten zich (op strategisch niveau) vrijwel uitsluitend op een *control-based* benadering, terwijl andere ziekenhuizen meer elementen van een *commitment-based* aanpak toevoegen. Onze resultaten laten bovendien zien dat de combinatie van beide managementbenaderingen ook varieert binnen ziekenhuizen (bijvoorbeeld door verschillen tussen afdelingen, managementposities of de functies van ondergeschikten) en in de loop van de tijd (bijvoorbeeld onder invloed van crisissituaties en omstandigheden die de aandacht van het ziekenhuis afleiden van patiëntveiligheid).

In **hoofdstuk 3** gaan we dieper in op de vraag waarom ziekenhuizen een specifieke veiligheidsmanagementbenadering kiezen. Met behulp van een heuristisch raamwerk gebaseerd op de *contextually based human resource theory*, analyseren we hoe interne organisatorische kenmerken en externe omgevingsfactoren de veiligheidsmanagementbenadering van ziekenhuizen beïnvloeden. De resultaten laten zien dat de keuzes die worden gemaakt bij het vormgeven van de veiligheidsmanagementbenadering sterk worden beïnvloed door eisen van stakeholders in de bredere institutionele omgeving. Daarnaast worden de keuzes in toenemende mate beïnvloed door concurrentiemechanismen die voortvloeien uit de marktwerking in de zorg. Managers in de dominante coalitie geven veelal de voorkeur aan een *control-based* managementbenadering wanneer ze weinig speelruimte ervaren en verwachten dat zorgverleners niet intrinsiek gemotiveerd zijn. Als ziekenhuizen bijvoorbeeld worden geconfronteerd met concrete en praktisch haalbare veiligheidseisen waarvan de klinische relevantie in twijfel wordt getrokken door zorgver-

leners, maar die gepaard gaan met strikt toezicht en ernstige gevolgen als niet aan de eisen wordt voldaan, dan monitoren en controleren managers veelal het gedrag van hun zorgverleners. De keuze voor een *commitment-based* managementbenadering vloeit daarentegen voort uit de verwachting dat veiligheidseisen leiden tot een intrinsieke motivatie bij zorgverleners, of uit situaties waarin de dominante coalitie voldoende speelruimte ervaart. Als ziekenhuizen worden geconfronteerd met klinisch relevante veiligheidseisen of abstracte eisen die moeilijk in concrete en controleerbare voorschriften kunnen worden omgezet, richten managers zich vaak op het vergroten van het bewustzijn van de veiligheidsrisico's, het tonen van de relevantie van veiligheidsinterventies en het stimuleren van een actieve rol van zorgverleners. Datzelfde geldt voor eisen die worden opgelegd door externe stakeholders waarbij de specifieke deskundigheid van zorgverleners nodig is om deze om te zetten in bruikbare veiligheidsprocedures. De ervaren speelruimte wordt ook beïnvloed door de motivatie en persoonlijke instelling van de leden van de dominante coalitie. Ziekenhuizen die zelf het initiatief nemen bij het vormgeven van het veiligheidsbeleid, zijn vaak ziekenhuizen die (meer) speelruimte ervaren en waarvan de leden van de dominante coalitie een proactieve rol spelen bij het prioriteren van patiëntveiligheid. Het optreden van veiligheidsincidenten of bijna-incidenten kan een belangrijke trigger zijn voor zo'n strategische keuze. Al met al laten onze resultaten zien dat eisen vanuit de institutionele omgeving, marktmechanismen en de strategische keuzes die ziekenhuizen zelf maken, resulteren in verschillende combinaties van *control-based* en *commitment-based* veiligheidsmanagement. Momenteel leidt druk vanuit de externe omgeving vaak tot de keuze voor een *control-based* benadering. Een meer gebalanceerde benadering vereist dat externe stakeholders hun reguleringsstijl aanpassen aan de specifieke situatie waarmee zij worden geconfronteerd: de naleving van veiligheidsregels zo nodig strikt handhaven, maar managers waar mogelijk meer speelruimte bieden.

Het tweede deel van dit proefschrift is gebaseerd op een cross-sectioneel vragenlijstonderzoek onder verpleegkundigen en verpleegkundig managers die werkzaam zijn op klinische ziekenhuisafdelingen. De kwantitatieve fase van ons onderzoek richt zich op de vraag hoe verschillende veiligheidsmanagementbenaderingen de attitudes en het gedrag van zorgverleners beïnvloeden, alsmede de patiëntveiligheid. In totaal zijn 11.809 verpleegkundigen die werkzaam zijn op de klinische afdelingen van 17 Nederlandse ziekenhuizen en hun 712 direct leidinggevenden (ofwel de verpleegkundig managers van de betreffende afdelingen) uitgenodigd om een vragenlijst in te vullen. **Hoofdstuk 4** beschrijft de ontwikkeling en het testen van de *ConCom Safety Management Scale*, een meetinstrument voor *control-based* en *commitment-based* veiligheidsmanagementbenaderingen van verpleegkundig managers in klinische ziekenhuisafdelingen. De conceptualisering van *control-based* en *commitment-based* veiligheidsmanagement zoals beschreven in hoofdstuk 2 vormt de basis voor het ontwikkelen van het meetinstrument. Per

sub-dimensie van de managementbenaderingen is een drie- tot zestal items ontwikkeld die de percepties van verpleegkundigen ten aanzien van de managementpraktijken en het leiderschapsgedrag van hun verpleegkundig manager meten. De nieuw ontwikkelde vragenlijst is getest in een sample van 2.378 verpleegkundigen die werkzaam zijn op de klinische afdelingen van de deelnemende ziekenhuizen. Om de psychometrische eigenschappen van het instrument te testen, is het uiteindelijke sample willekeurig verdeeld in twee groepen: één sample (N=1.165) is gebruikt om ons oorspronkelijke model te toetsen en te herzien; het tweede sample (N=1.213) is gebruikt voor een kruisvalidering van het uiteindelijke model. De psychometrische eigenschappen van het meetinstrument zijn beoordeeld met behulp van conformatieve factoranalyses en betrouwbaarheidsanalyses. Onze bevindingen ondersteunen de constructvaliditeit en betrouwbaarheid van de *ConCom Safety Management Scale*. Het uiteindelijke model bestaat uit zeven subdimensies die kunnen worden toegewezen aan ofwel *control-based* ofwel *commitment-based* veiligheidsmanagement. Een *control-based* managementbenadering bestaat uit drie sub-dimensies, namelijk: (1) het benadrukken van het belang van veiligheidsregels en -voorschriften; (2) toezicht op de naleving van deze regels; en (3) medewerkers feedback geven. Een *commitment-based* managementbenadering bestaat uit vier subdimensies, namelijk: (1) voorbeeldgedrag; (2) het creëren van veiligheidsbewustzijn; (3) het tonen van commitment; en (4) een actieve bijdrage van zorgverleners stimuleren. De constructvaliditeit van het meetinstrument wordt ondersteund door hoge factorladingen. De bevindingen leveren een eerste bewijs dat *control-based* en *commitment-based* veiligheidsmanagement twee verschillende, maar sterk gerelateerde constructen zijn. De uiteindelijke versie van de *ConCom Safety Management Scale* bestaat uit 33 items en toont acceptabele indicatoren voor 'passendheid' (*goodness-of-fit*) en interne consistentie (Cronbach's α van de sub-schalen varieert van 0.59-0.90). De bevindingen werden bevestigd tijdens een kruisvalidering van het uiteindelijke model.

In hoofdstuk 5 en 6 proberen we vervolgens inzicht te krijgen in de invloed van *control-based* en *commitment-based* veiligheidsmanagement op de attitudes en het gedrag van zorgverleners en de patiëntveiligheid. **Hoofdstuk 5** gaat in op de relaties tussen *control-based* en *commitment-based* veiligheidsmanagement, het veiligheidsklimaat (*climate for safety),* de psychologische veiligheid (*psychological safety*) en de bereidheid van verpleegkundigen om elkaar aan te spreken (*speaking up*). Voor de veiligheid van patiënten is het belangrijk dat zorgverleners elkaar zo nodig aanspreken. Uit eerder onderzoek is echter gebleken dat zorgprofessionals vaak aarzelen om hun zorgen over de patiëntveiligheid te uiten. Direct leidinggevenden kunnen een belangrijke rol spelen bij het stimuleren van aanspreekgedrag. Er bestaat echter nog onvoldoende duidelijkheid over de relatie tussen het gedrag van managers en de percepties van medewerkers of het veilig en zinvol is om hun zorgen over de patiëntveiligheid te uiten en elkaar aan te

spreken. Ons onderzoek resulteerde in een sample van 980 verpleegkundigen en 93 van hun direct leidinggevenden (ofwel de verpleegkundig managers van de klinische afdelingen waar de verpleegkundigen werken). De verpleegkundig managers beantwoordden vragen over de door hen gebruikte managementbenaderingen. Verpleegkundigen beantwoordden vragen over de gepercipieerde veiligheidsmanagementbenaderingen van hun direct leidinggevende, het veiligheidsklimaat, de psychologische veiligheid en hun intenties om elkaar (zo nodig) aan te spreken. Om onze hypotheses te toetsen werden *paired samples* t-testen, hiërarchische regressieanalyses (op afdelingsniveau) en multi-level regressieanalyses uitgevoerd. Onze resultaten laten een verschil zien tussen de percepties van verpleegkundigen en de percepties van managers over de veiligheidsmanagementbenaderingen die managers in de praktijk gebruiken: managers zeggen dat ze meer doen aan veiligheidsmanagement dan wat verpleegkundigen ervaren. Verpleegkundigen zijn zich mogelijk niet altijd bewust van alles wat hun manager doet met betrekking tot veiligheidsmanagement. Als verpleegkundigen ervaren dat hun direct leidinggevende het belang van veiligheidsregels benadrukt, toezicht houdt op de naleving van regels en hen feedback geeft (een *control-based* managementbenadering), ervaren zij dat er een groot belang wordt gehecht aan patiëntveiligheid (veiligheidsklimaat). Verpleegkundigen die ervaren dat hun direct leidinggevende betrokkenheid en voorbeeldgedrag toont, bewustwording creëert en hen aanmoedigt om actief deel te nemen aan het verbeteren van de patiëntveiligheid (een *commitment-based* benadering), ervaren dat de omgeving psychologisch veilig is voor het nemen van interpersoonlijke risico's. De psychologische veiligheid blijkt positief gerelateerd te zijn aan de bereidheid van verpleegkundigen om elkaar aan te spreken. Bovendien blijkt uit onze resultaten dat de relatie tussen de percepties van verpleegkundigen ten aanzien van een *commitment-based* managementbenadering en hun intenties om elkaar aan te spreken volledig wordt gemedieerd door de ervaren psychologische veiligheid. Dus zowel een *control-based* als een *commitment-based* managementbenadering lijkt relevant te zijn voor het managen van patiëntveiligheid, maar als het gaat om het stimuleren van aanspreekgedrag is een *commitment-based* benadering het meest waardevol.

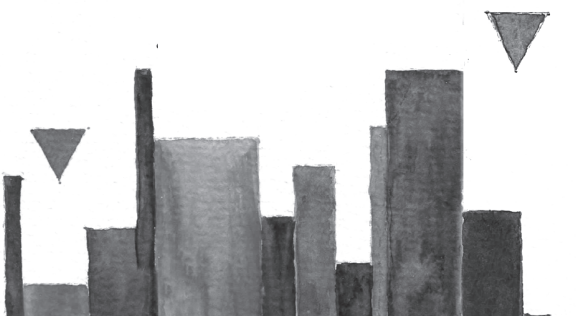
In **hoofdstuk 6** onderzoeken we hoe verpleegkundig managers hun verpleegkundigen kunnen stimuleren om suggesties te doen voor het verbeteren van de patiëntveiligheid. Verpleegkundigen kunnen een belangrijke rol spelen bij het verbeteren van de veiligheid van de zorg omdat hun werk hen waardevolle inzichten biedt in mogelijke veiligheidsproblemen en oplossingen. Er is echter weinig bekend over hoe verpleegkundig managers verpleegkundigen kunnen stimuleren om suggesties aan te dragen, noch over de invloed van de bredere werkomgeving, inclusief het veiligheidsklimaat. Het doel van hoofdstuk 6 is daarom om inzicht te krijgen in hoe *control-based* en *commitment-based* veiligheidsmanagement in combinatie met het veiligheidsklimaat van een afdeling invloed hebben

op de mate waarin verpleegkundigen suggesties doen voor het verbeteren van de patiëntveiligheid. Onze hypotheses zijn getoetst in een sample van 957 verpleegkundigen en 92 verpleegkundig managers. Verpleegkundigen beantwoordden vragen over de gepercipieerde veiligheidsmanagementbenaderingen van hun direct leidinggevende (ofwel de verpleegkundig manager van hun afdeling), het veiligheidsklimaat en de (ervaren) patiëntveiligheid op de afdeling. Verpleegkundig managers beoordeelden in welke mate de verpleegkundigen aan wie zij leiding geven suggesties doen voor het verbeteren van de patiëntveiligheid. De hypotheses zijn getoetst met behulp van de PROCESS-module van Hayes. Alle analyses zijn uitgevoerd op afdelingsniveau. Onze resultaten laten zien dat wanneer verpleegkundigen op een afdeling meer suggesties aandragen voor het verbeteren van de patiëntveiligheid dit positief gerelateerd is aan de ervaren patiëntveiligheid. We vonden geen directe relatie tussen de ervaren *control-based* managementbenadering en de mate waarin verpleegkundigen suggesties aandragen. Evenmin werden aanwijzingen gevonden voor een modererende rol van het veiligheidsklimaat binnen deze relatie. Blijkbaar wordt de bereidheid van verpleegkundigen om suggesties te doen niet belemmerd of bevorderd wanneer zij meer *control-based* veiligheidsmanagement ervaren. Wanneer verpleegkundigen ervaren dat hun direct leidinggevende meer *control-based* managementpraktijken gebruikt, geven zij over het algemeen wel een positievere beoordeling aan de patiëntveiligheid binnen de afdeling. De percepties van verpleegkundigen over een *commitment-based* managementbenadering zijn daarentegen positief gerelateerd aan de mate waarin verpleegkundigen suggesties doen, hoewel deze relatie slechts marginaal significant is. De relatie tussen *commitment-based* veiligheidsmanagement en het doen van suggesties wordt gemodereerd door het veiligheidsklimaat. Hoge niveaus van waargenomen *commitment-based* management hebben een significant effect op het aandragen van suggesties wanneer verpleegkundigen ervaren dat patiëntveiligheid binnen de afdeling hoog in het vaandel staat. Daarnaast vonden we een marginaal significant indirect effect van *commitment-based* veiligheidsmanagement op de percepties van verpleegkundigen over de patiëntveiligheid binnen hun afdeling via het aandragen van suggesties. De relatie tussen *commitment-based* management en de ervaren patiëntveiligheid wordt gemedieerd door de mate waarin verpleegkundigen suggesties doen, wanneer verpleegkundigen binnen de afdeling een sterk veiligheidsklimaat ervaren. Onze resultaten laten dus zien dat als verpleegkundig leidinggevenden hun verpleegkundigen willen stimuleren om suggesties aan te dragen – en daarmee de (ervaren) patiëntveiligheid willen verbeteren – zij gelijktijdig moeten focussen op het benadrukken van een *commitment-based* managementbenadering en het versterken van het veiligheidsklimaat.

Ten slotte worden in de algemene discussie in **hoofdstuk 7** de belangrijkste bevindingen van dit proefschrift gepresenteerd en besproken. In dit proefschrift wordt geconcludeerd

dat veiligheidsmanagement een multidimensionaal construct is, bestaande uit twee afzonderlijke maar nauw verwante benaderingen om medewerkers aan te sturen: een *control-based* en een *commitment-based* veiligheidsmanagementbenadering. Het multidimensionale construct kan elke mogelijke combinaties aannemen van *control-based* en *commitment-based* managementpraktijken. Hoe beide managementbenaderingen worden gecombineerd varieert, afhankelijk van de hiërarchische niveaus binnen een organisatie en de situatie waarmee een manager te maken heeft. Uit onze resultaten blijkt dat managers op strategisch (ziekenhuis) niveau vaak kiezen voor een basis van een *control-based* managementbenadering, terwijl verpleegkundig managers op operationeel (afdelings-) niveau de voorkeur geven aan het leggen van een basis van *commitment-based* managementpraktijken. De keuze van managers om de nadruk te leggen op *control-based* of *commitment-based* management is echter niet zo zwart wit. Specifieke omgevingskenmerken, kenmerken van de veiligheidsvraagstukken, persoonlijke voorkeuren en de mate waarin verpleegkundig managers zelf actief met veiligheidsmanagement bezig zijn, zijn allemaal van invloed op het vormgeven van de veiligheidsmanagementbenadering. Verpleegkundig managers wordt aangeraden om hun managementbenadering af te stemmen op het belang en de urgentie van veiligheidskwesties en de mate van intrinsieke motivatie van de verpleegkundigen aan wie zij leiding geven. In het verlengde hiervan bespreken we de rol van externe stakeholders die het gebruik van beide managementbenaderingen zouden moeten stimuleren door verschillende reguleringsmechanismen te combineren en deze afwisselend in te zetten afhankelijk van de situatie waarmee zij te maken hebben. Onze bevindingen laten immers zien dat beide managementbenaderingen op hun eigen manier bijdragen aan de attitudes en het gedrag van verpleegkundigen. Daarom pleiten we er ook voor om een *control-based* managementbenadering te herwaarderen als het gaat om veiligheidsmanagement. In tegenstelling tot de negatieve connotatie die in de praktijk en in de literatuur aan *control-based* management kleeft, hebben wij geconstateerd dat verpleegkundigen *control-based* veiligheidsmanagement interpreteren als een weerspiegeling van het belang dat aan patiëntveiligheid wordt gehecht in plaats van een teken van wantrouwen. Op basis van ons onderzoek concluderen we dat verpleegkundig managers een belangrijke rol spelen bij het stimuleren van de attitudes en het (gewenste) gedrag van verpleegkundigen. Toch vormen verpleegkundig managers slechts één (belangrijke) schakel in de keten van veiligheidsmanagement en is het belangrijk dat zij samenwerken met managers op hogere organisatieniveaus, medisch managers en informele leiders die ook een rol spelen bij het managen van de patiëntveiligheid. Veiligheidsmanagement vereist dus samenhang (ofwel synergie) op alle niveaus: samenhang tussen de veiligheidsmanagementbenaderingen, samenhang tussen de verschillende formele en informele leiders in een ziekenhuis en samenhang tussen alle interne en externe stakeholders die betrokken zijn bij veiligheidsmanagement.

Dankwoord



Often we become so focused on the finish line that we fail to enjoy the journey.

Als klein meisje wilde ik schrijfster worden. Kinderboekenschrijfster. Voor het gemiddelde kind is het lezen van dit boek wellicht iets te hoog gegrepen, maar met het schrijven van het dankwoord van dit proefschrift kan ik 'een eigen boek' wel van m'n wensenlijstje afstrepen. In de afgelopen jaren heb ik regelmatig uitgekeken naar het moment dat ik dit einddoel zou bereiken. Het einddoel van een bijzondere reis. Een reis door bergachtig gebied. Soms langs eentonige landschappen, maar altijd afgewisseld met vele interessante plaatsen. Een reis die mede dankzij de betrokkenheid, input, hulp en steun van velen meer dan de moeite waard was!

Allereerst wil ik graag alle ziekenhuizen bedanken die deelnamen aan het onderzoek. De openhartige gesprekken met leidinggevenden in alle lagen van de organisatie gaven me een inspirerend inkijkje in het managen van patiëntveiligheid. De voorbeelden en dilemma's die tijdens deze gesprekken werden beschreven vormden een belangrijke drijfveer voor mijn onderzoek. Ook ben ik veel dank verschuldigd aan alle verpleegkundigen en afdelingshoofden die, tussen de patiëntenzorg door, tijd hebben vrijgemaakt voor het invullen van een vragenlijst. Zonder jullie bijdrage was dit onderzoek niet mogelijk geweest.

Robbert Huijsman, Jaap Paauwe en Jeroen van Wijngaarden, mijn promotoren en copromotor. Ik ben blij dat jullie naast me stonden tijdens het schrijven van dit proefschrift. Het begrip 'synergie' is niet alleen van toepassing op de managementbenaderingen die we hebben onderzocht, maar zeker ook op onze samenwerking. Ik kijk met veel plezier terug op onze overleggen, waarin inhoudelijke discussies en constructieve feedback werden afgewisseld met *small talk* over vakanties, werk en alles wat ons verder bezig hield. Jullie gaven me de vrijheid om mijn eigen onderzoek vorm te geven en hebben me gecoacht om te kunnen groeien als onderzoeker. Jaap, dank voor je vertrouwen om mij – nadat Kees van Wijk me had overgehaald om te solliciteren – de kans te geven om onderzoek te doen binnen HSMO en de Universiteit van Tilburg. Je kritische blik en gedetailleerde feedback op alle stukken leidden altijd weer tot verbeteringen. Ik heb veel gehad aan onze interessante discussies over (de analyses voor) het context model, je reistips voor de mooie stad Sevilla en heb je interesse in mij als persoon erg gewaardeerd. Robbert, mede dankzij jouw netwerk kreeg het onderzoek z'n huidige omvang. Dank voor je scherpe blik vanuit de wetenschap en de praktijk, je vele suggesties en ideeën, en je hulp bij het inkorten van mijn teksten. Je steun en onze wekelijkse belmomenten in de tijd dat het wat minder ging hebben veel voor mij betekend. Jeroen, altijd stond je deur voor me open. Als het even kon schoof je je andere werk aan de kant om mee te denken over analyses, de verhaallijn of het 'spannender' maken van een tekst. Na zo'n gesprek had ik

het gevoel dat ik weer verder kon. Je wist mij het vertrouwen te geven dat het goed zou komen. Ik kijk met veel plezier terug op onze samenwerking; wie weet kunnen we hier nog eens een vervolg aan geven.

Karina van de Voorde, je enthousiasme voor onderzoek en statistische analyses werkt aanstekelijk. Veel dank voor de tijd die je nam om met mij mee te denken over de analyses en voor je uitgebreide feedback op mijn artikelen. Schrijven voor medische bladen bleek in sommige opzichten 'anders' dan schrijven voor een HR journal. Ik heb veel geleerd van onze samenwerking. Mathilde Strating, wat fijn dat je mij op weg wilde helpen in de wereld van vragenlijstontwikkeling en factoranalyses. De analyses hebben ons heel wat hoofdbrekens opgeleverd, maar gelukkig stond ik daar niet alleen voor. Ik wil je bedanken voor je hulp, interesse en betrokkenheid.

Geachte leden van de promotiecommissie, bedankt voor het lezen en beoordelen van mijn proefschrift en uw bereidheid om te opponeren tijdens de verdediging.

Vicki en Elise, samen staken we de 'handen uit de mouwen' voor het onderzoek van het gelijknamige SRZ project. Ik wil jullie bedanken voor het meedenken over het vormgeven en uitzetten van het vragenlijstonderzoek. De leden van de stuurgroep Handen uit de Mouwen wil ik graag bedanken voor het kijkje in de keuken van dit ambitieuze verbetertraject en de mogelijkheid die jullie me hebben gegeven om hier als onderzoeker in te participeren. Bo en Kristie, wat ben ik blij dat een deel van de dataverzameling bij jullie in goede handen was. Vragenlijsten uitzetten binnen 17 ziekenhuizen en onder honderden leidinggevenden en duizenden zorgprofessionals bleek een enorme klus. Het enthousiasme waarmee jullie hier, als onderdeel van jullie scriptietraject, aan mee geholpen hebben was erg fijn.

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afgesloten met nog even bijkletsen, het was fijn om zo veel herkenbare ervaringen met elkaar te kunnen delen. Willemijn, altijd attent en betrokken. Een groot deel van ons promotietraject liep parallel aan elkaar, wat fijn om nu ook samen de eindstreep te bereiken: we did it! (Oud-) collega's van de Universiteit van Tilburg: ondanks dat ik niet vaak bij jullie aanwezig was, voelde ik me altijd welkom. Dank dat jullie me wegwijs hebben gemaakt in de wereld van HRM en voor jullie interesse en gezelligheid. Eva, samen treinen tussen Rotterdam en Tilburg is een stuk leuker, zeker als er tijdens de overstap ook nog tijd is voor een cappuccino!

Lieve familie en vrienden. In de afgelopen jaren was mijn proefschrift altijd op de achtergrond aanwezig. Jullie zorgden gelukkig voor de nodige afleiding en ontspanning. Dank voor jullie interesse, de gezellige etentjes, jullie verhalen als dokter en de vele koppen thee om even bij te kletsen. Anke, we hebben afgelopen jaren heel wat discussies gevoerd over dokters, managers en de zorg. Dankjewel voor alle goede gesprekken, de bezoekjes aan de Ikea en het tuincentrum, en de mooie reizen die we samen hebben gemaakt. Chantal, ondanks dat het er in de afgelopen jaren door de afstand wat minder vaak van kwam om af te spreken, voelt het altijd weer vertrouwd als we elkaar zien. Veertien jaar geleden vertrokken we samen naar 'die grote, onbekende stad', ik ben blij dat je ook naast me staat op de dag dat ik mijn Rotterdamse avontuur afsluit!

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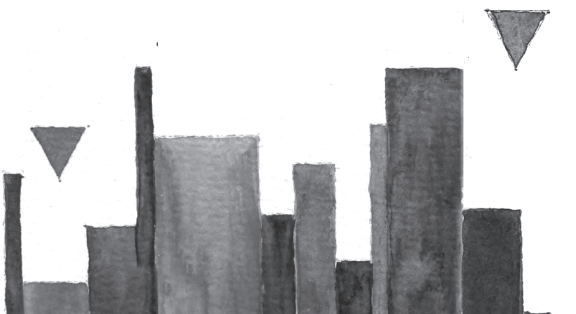
Lieve pappa en mamma, wat is het fijn om een thuis te hebben waar je altijd naar terug kunt keren. Voor een weekendje gezelligheid, een weekje vakantie of als het nodig is zelfs een paar maanden. Dankjewel dat jullie altijd weer voor ons klaar staan! Mamma, in de afgelopen tijd groeide de omslag van dit proefschrift uit tot een waar familieproject.

Wat bijzonder dat jij de afbeelding voor de omslag hebt gemaakt en wat is het mooi geworden!

Lieve Jeffrey, het laatste puzzelstukje ligt op z'n plek. Als iemand de ups en downs van mijn promotietraject van dichtbij heeft meegemaakt ben jij het wel. Je geeft mij de ruimte, maar bent er ondertussen altijd voor me als ik je nodig heb. Je steun, positiviteit en vertrouwen zijn van onschatbare waarde. Ik kijk uit naar nog heel veel mooie momenten samen!

Curriculum Vitae

PhD portfolio
Publications
About the author



PHD PORTFOLIO

Summary of PhD training and teaching

Name PhD student:	Carien W. Alingh
Department:	Erasmus School of Health Policy & Management
PhD period:	2012 – 2016
Promotors:	Prof. dr. Robbert Huijsman, MBA
	Prof. dr. Jaap Paauwe
Co-promotor:	dr. Jeroen D. H. van Wijngaarden

PhD training	Year	Workload (hours/ECTS)
Courses in general academic and research skills		
Academic writing in English for PhD students	2012	2 ECTS
Scale Development	2012	16 hours
Construction and Analysis of Questionnaires	2012	13 hours
PhD course Continuous Improvement Methods in Healthcare	2012	2 ECTS
Advanced Studies in HRM	2013	6 ECTS
Qualitative interviewing	2013	14 hours
English language course	2013	20 hours
Introduction to structural equation models (SEM)	2014	12 hours
The art of presenting science	2014	10 hours
Personal effectiveness	2014	24 hours
Introduction to multilevel analysis	2015	1,5 ECTS
Career counselling for PhDs	2015	12 hours
Courses in didactic skills		
Introductory module	2012	8 hours
Mentoring	2012	16 hours
Assessment and feedback	2012	8 hours
Supervision of writing assignments	2013	16 hours
Teaching: tutoring workgroups	2013	8 hours
Thesis supervision	2014	16 hours

Presentations	Year
Presentations during (inter)national conferences	
Seminar on improving people performance in healthcare, poster presentation (Rotterdam, the Netherlands)	2012

Dutch HRM Network conference, presentation entitled "Committed to patient safety: A human approach to resources" (Leuven, Belgium)	2013
International Research Society for Public Management (IRSPM) conference, presentation entitled "How to manage patient safety in hybrid hospital contexts" (Ottawa, Canada)	2014
Seminar on improving people performance in healthcare, presentation entitled "Commitment or control: Managing patient safety in Dutch hospitals" (Utrecht, the Netherlands)	2014
IX International Workshop on HRM, presentation entitled "Commitment or control: Patient safety management in Dutch hospitals" (Sevilla, Spain)	2014
Dutch HRM Network conference, presentation entitled "Contextualizing safety management approaches in hospital care" (Utrecht, the Netherlands)	2015
Seminar on improving people performance in healthcare, presentation entitled "Developing and testing a measurement instrument for control- and commitment-based safety management of nurse leaders in clinical departments" (Belfast, Ireland)	2016

Presentations during other meetings

HRM & Healthcare track, conference 25 years HRS (Tilburg University, the Netherlands)	2012
Research Meeting HR Studies (Tilburg University, the Netherlands)	2013
PhD Meeting HR Studies (Tilburg University, the Netherlands)	2013
PhD Meeting HR Studies (Tilburg University, the Netherlands)	2014
Seminar "Veilig werken heb je zelf in de hand?!" (Seminar Samenwerkende Rijnmond Ziekenhuizen, Rotterdam, the Netherlands)	2014
HSMO Meeting (Erasmus University Rotterdam, the Netherlands)	2015
Seminar "Leren van wat goed gaat, hebben we daar tijd voor?" (Seminar Samenwerkende Rijnmond Ziekenhuizen, Rotterdam, the Netherlands)	2015

Attended seminars and workshops

Seminar "Veiliger zorg: blame free of met de billen bloot?"	2012
Conference HRM in health care	2012
Seminar "Patiëntveiligheid en Risicomanagement: En nu handen uit de mouwen"	2013
Seminar HR Studies Tilburg	2014
Seminar "How to publish a world class paper"	2014
Conference: "Safety 2 and beyond - resilience meets regulation"	2015

Teaching activities	Year
Lecturing	
Tutor internship 3rd year bachelor students (bachelor)	2011/2012
Course co-coordinator Safety Management (master)	2011/2012
Tutor workgroups introduction week 1st year bachelor students (bachelor)	2012/2013
Tutor workgroups Organization Science (bachelor)	2012/2013
Grading assignments Human Resource Management (master)	2012/2013
Course co-coordinator Safety Management (Master)	2012/2013
Tutor internship 3rd year bachelor students (bachelor)	2012/2013
Mentor 1st year bachelor students (bachelor)	2013/2014
Tutor internship 1st year bachelor students (bachelor)	2013/2014
Tutor workgroups Organization Science (bachelor)	2013/2014
Mentor 1st year bachelor students (bachelor)	2014/2015
Tutor internship 1st year bachelor students (bachelor)	2014/2015
Tutor workgroups Organization Science (bachelor)	2014/2015
Tutor workgroups Organization Science (premaster)	2015/2016
Supervising and co-evaluating theses	
Supervising Bachelor theses	2012/2013
Supervising Master theses	2012/2013
Co-evaluator Master theses	2013/2014
Supervising Master theses	2014/2015

Other activities	Year
Board member Erasmus PhD Association Rotterdam (EPAR)	2013/2014

LIST OF PUBLICATIONS

Alingh, C. W., Strating, M. M. H., van Wijngaarden, J. D. H., Paauwe, J., & Huijsman, R. (2018). The ConCom Safety Management Scale: Developing and testing a measurement instrument for control-based and commitment-based safety management approaches in hospitals. *BMJ Quality & Safety*. Advance online publication. doi:10.1136/bmjqs-2017-007162

Alingh, C. W., van Wijngaarden, J. D. H., Huijsman, R., & Paauwe, J. (2018). The influence of environmental conditions on safety management in hospitals: a qualitative study. *BMC Health Services Research*, *18*(313). doi:10.1186/s12913-018-3116-8

Alingh, C. W., van Wijngaarden, J. D. H., Paauwe, J., & Huijsman, R. (2015). Commitment or Control: Patient Safety Management in Dutch Hospitals. In R. Valle-Cabrera & A. López-Cabrales (Eds.), *New Clues for Analysing the HRM Black Box* (pp. 97-124). Newcastle upon Tyne, United Kingdom: Cambridge Scholars.

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ABOUT THE AUTHOR

Carien Alingh was born in Groningen on October 30th 1985. After graduating from secondary school (gymnasium) at Ubbo Emmius in Stadskanaal, she started studying Medicine at the Erasmus University Rotterdam. She obtained her doctoral degree in Medicine in 2009. During these years, she developed a special interest for the organisational processes and managerial issues in healthcare. Therefore, she continued to study a premaster in Health Sciences and a Master in Health Care Management. After graduating her Master, Carien started working as a PhD candidate at the Erasmus School of Health Policy & Management (former Institute of Health Policy & Management), in February 2012. She worked on her dissertation at the Erasmus School of Health Policy & Management as well as the department of Human Resource Studies of Tilburg University. Her PhD project focused on patient safety management in hospitals. How do (nurse) managers manage patient safety and what are the effects of different safety management approaches on healthcare professionals' safety attitudes, behaviour and patient safety performance? A total of twenty hospitals participated in the qualitative and / or quantitative phases of the study. The results of the PhD project are described in this dissertation, presented during national and international conferences and published in international peer reviewed journals. As a teacher, Carien was involved in several courses in the Bachelor, Pre-master and Master program Health Sciences. Furthermore, she worked as a Policy Advisor Research at the Erasmus School of Health Policy & Management. As of April 1st 2018, Carien works as an advisor at the Regionale Ondersteuningsstructuur Proscoop.

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