

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

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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 (Burriss, Detert, & Chiaburu, 2008; Chen, Wang, Chang, & Hu, 2008), leader’s openness for suggestions (Detert & Burriss, 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.

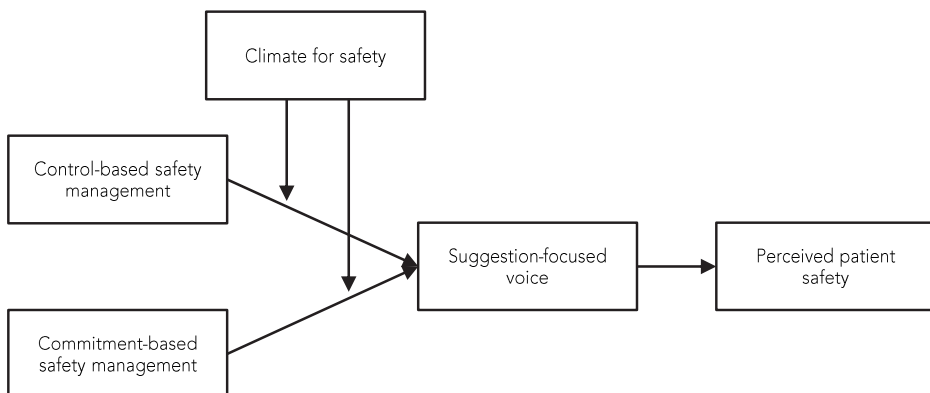


Figure 1 Conceptual model

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 voluntarily 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.

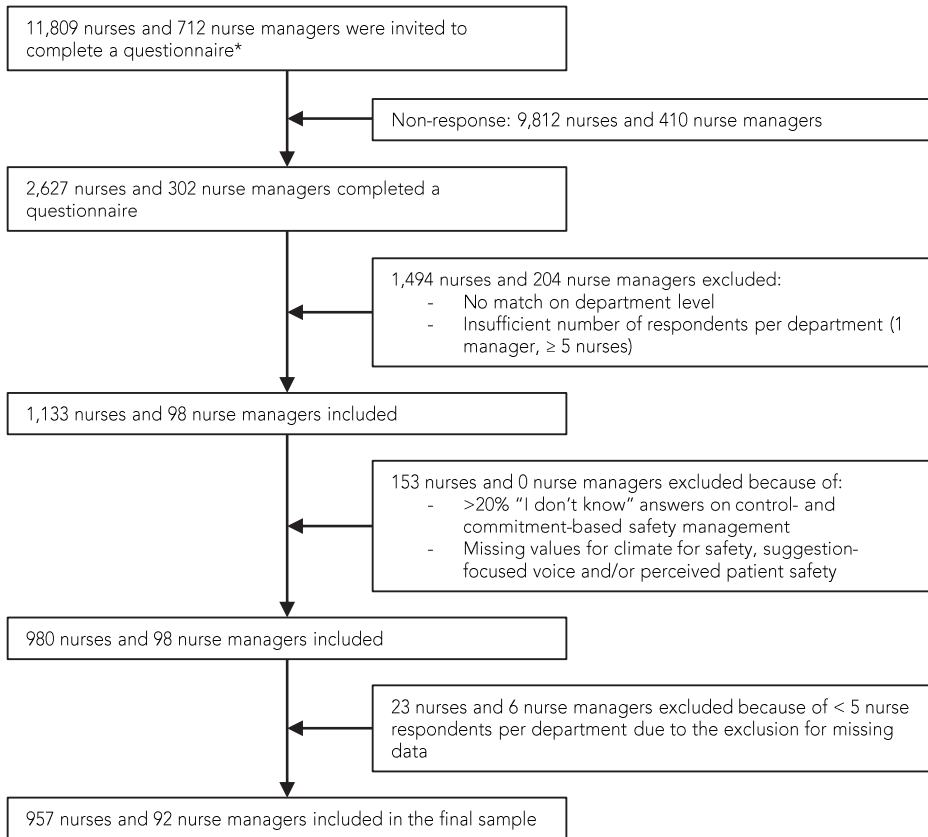


Figure 2 Selection process respondents

* 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)	
	Mean (range)	SD	Mean (range)	SD
Age				
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. Consequently, 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	-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 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.