Risk Management and Healthcare Policy

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ORIGINAL RESEARCH

Improving Patient Safety and Care Quality Through a "Speaking-Up" Climate: The Mediating Role of Situation Monitoring

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Purpose: In healthcare settings, a climate that encourages speaking up among staff is believed to enhance patient safety and quality of care. However, the specific mechanisms of this relationship remain underexplored. Particularly, there is a need to understand how components of teamwork, such as situation monitoring, can be linked to the impact of a speaking-up climate on relevant outcomes. This study aimed to investigate the direct and indirect effects of a speaking-up climate on patient safety and quality of care using situation monitoring as a potential mediator.

Patients and Methods: This cross-sectional study used survey data from 380 staff nurses who provided direct patient care at three Korean hospitals. Structural equation modeling was utilized to test a hypothesized mediation model using Mplus 7.0.

Results: Our data analysis confirmed the partial mediation model. As hypothesized, a speaking-up climate directly improved patient safety ($\beta = 0.384$, $p < 0.001$) and quality of care ($\beta = 0.393$, $p < 0.001$). Also, we found that indirect effects of a speaking-up climate on patient safety ($\beta = 0.224$, $p < 0.001$) and quality of care ($\beta = 0.186$, $p = 0.005$) through situation monitoring were significant. These results indicate that situation monitoring was found to significantly mediate the relationship between a speaking-up climate, patient safety, and quality of care.

Conclusion: Our study demonstrates that the positive impact of a speaking-up climate extends beyond improving nurses' speaking up. Further, fostering a speaking-up climate can significantly improve patient safety and quality of care, and situation monitoring has a critical role in this relationship. These findings contribute to understanding how encouraging a speaking-up climate could benefit patient safety and care quality in healthcare organizations.

Keywords: healthcare, nurse, nursing, organizational climate, teamwork

Introduction

In the healthcare field, *speaking up* refers to the practice in which professionals voice their concerns regarding factors that might impact patient safety and care quality by identifying risky or inadequate practices within their teams.[1] This form of proactive communication could manifest as sharing important information, posing questions, or providing different perspectives.[2] Openly expressing concerns can help avoid harmful practices, violations, or errors, thereby facilitating a learning environment and fostering opportunities for improvement.[3] However, the act of speaking up presents serious challenges and risks owing to hierarchical cultures and power imbalances within healthcare settings as well as the potential for damaging professional relationships.[3,4]

In the context of Korea, healthcare professionals, particularly nurses, face specific challenges related to speaking up. These include a strong hierarchical culture, social norms that discourage questioning authority, and insufficient institutional support for open communication.[5–7] Research indicates that Korean nurses often choose silence even when patient safety is at risk.[5] Addressing these challenges is crucial to enhance patient safety and care quality as speaking up about errors and near misses can prevent adverse incidents from recurring.[8]

Received: 27 March 2024
Accepted: 24 August 2024
Published: 28 August 2024

The decision to speak up or remain silent is a highly complex, context-dependent process influenced by various factors.[9] Among these, the speaking-up climate within an organization plays a crucial role. A supportive organizational atmosphere, characterized by a strong safety climate, effective leadership, and a culture that values open communication, significantly increases the likelihood of healthcare professionals speaking up.[10,11] For example, research has shown that, when an organization emphasizes the importance of reporting medical errors, nurses are more likely to do so, thereby enhancing patient safety.[11] Additionally, a positive speaking-up climate has been linked to an increased frequency of such behaviors among healthcare professionals.[2] Despite these encouraging findings, further investigation is needed to fully understand the direct relationship between a speaking-up climate and improvements in patient safety and care quality as well as the mechanisms underlying this relationship.

Additionally, a speaking-up climate is vital for effective teamwork in healthcare settings. Such an environment not only fosters collaboration but also enhances situation awareness, which is crucial for preventing errors. Further underscoring the importance of teamwork in achieving better safety and quality outcomes, prior research has shown that a positive teamwork climate can significantly reduce patient harm and mortality and improve care quality.[12,13] A key component of teamwork is situation monitoring, which involves situation awareness (ie, understanding one's work conditions) and a shared mental model (ie, the collective understanding among team members about a situation or process that is typically achieved through communication).[14] Situation monitoring helps team members resolve issues between them, understand the surrounding environment, track patient conditions, and learn appropriate measures for preventing errors.[15] The failure to voice important safety concerns can lead to a lack of awareness regarding patients' worsening conditions, thereby diminishing overall situation monitoring.[16] Although previous research has found that an environment that supports open communication can enhance staff perceptions of teamwork climate in hospital units,[17] whether this translates into better safety and quality outcomes remains unknown to our knowledge. Thus, we hypothesized that a speaking-up climate would be positively associated with situation monitoring, a key component of teamwork, subsequently improving patient safety and quality of care.

Despite considerable research on organizational climates, few studies have directly linked the impact of a speaking-up climate to patient safety and quality of care. Thus, the current study aimed to address this gap using the structure-process-outcome model proposed by Donabedian (1988), which is a framework extensively utilized to assess the quality of care in healthcare services.[18,19] According to this model, the *structure*, referring to various attributes of the setting, influences the *process*, which is how care is actually delivered.[20,21] This process then determines the *outcome*, which refers to the effects of care on the patient's health.[21] In the context of our study, the *structure* corresponds to a speaking-up climate within nursing units. The *process* reflects situation monitoring practice, and the *outcome* includes nurse-assessed patient safety and quality of care.

Thus, our study aimed to investigate the influence of a speaking-up climate on patient safety and quality of care, focusing on the mediating role of situation monitoring. By examining these relationships, we aimed to provide empirical evidence to test the following hypotheses:

H1. A speaking-up climate is positively related to patient safety and quality of care.

H2. A speaking-up climate is positively related to situation monitoring.

H3. Situation monitoring is positively related to patient safety and quality of care.

H4. The effects of a speaking-up climate on patient safety and quality of care are mediated by situational monitoring.

Materials and Methods

Design, Setting, and Participants

This cross-sectional study utilized data from a larger, multifaceted intervention study that aimed to improve patient safety and quality of care in acute care hospitals. This current study used survey data collected between October and December 2023 from 380 staff nurses who provided direct patient care in 10 nursing units in 3 Korean hospitals. To

control for the potential impact of hospital characteristics on the survey outcomes, we specifically selected hospitals with similar attributes.[22] All chosen hospitals had over 800 beds, were teaching hospitals, operated as nonprofit organizations, and were situated in urban areas. We employed a purposive sampling method to select the hospitals based on specific criteria to ensure homogeneity in hospital characteristics.

All nurses who were working in the participating units and hospitals during the data-collection period were invited to participate. We excluded data from nurses in managerial positions because perceptions of safety culture vary between healthcare staff and managers.[23] A sample size of 380 was deemed sufficient to achieve 0.8 power to detect medium effects in structural equation modeling (SEM) analysis and to conduct bias-corrected bootstrap tests of indirect effects.[24] Furthermore, in SEM, Kline[25] suggests a sample size of 10 to 20 participants per number of estimated parameters, and the current ratio (42:1) exceeds the most stringent threshold.

Ethical Considerations

This study was conducted following ethical guidelines for research involving human participants. Approval was obtained from the Yonsei University Health System Institutional Review Board (4–2023-0979) before the commencement of data collection. All participants were provided with comprehensive information about the study, including its purpose, procedures, potential risks, and benefits. Participation was entirely voluntary, and informed consent was obtained from each nurse prior to their involvement in the study. We assured participants that their responses would be kept confidential and anonymous. Participants were also informed that they could withdraw at any time without penalty.

Measures

Predictor Variable

Speaking-up climate was measured using the five-item Speaking-Up Climate for Patient Safety Tool. This instrument has demonstrated good reliability and construct validity[26] and has been translated into Korean and validated in a prior study using Korean nurses as a sample.[27] A sample item is, "In my clinical area, it is difficult to speak up if I have a patient safety concern." Responses were rated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) with higher scores indicating climates more conducive to patient safety within the unit. The internal consistency of the measure in a previous Korean study was reported with a Cronbach's alpha value of 0.78;[27] in the current study, the value was 0.78.

Mediating Variable

Situation monitoring was assessed using the Situation Monitoring subscale of the Teamwork Perceptions Questionnaire.[28] This instrument has been translated and validated among Korean nurses.[29] The subscale consists of seven items measured on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). An example item is, "Staff share information regarding potential complications (eg, patient changes, bed availability)." In a previous Korean study, the instrument had a Cronbach's alpha of 0.85;[27] in the current study, it was found to have a Cronbach's alpha of 0.87, indicating good internal consistency.

Outcome Variables

The first outcome variable, *patient safety*, was assessed using a single-item measure from the Korean version of the Hospital Survey on Patient Safety Culture 2.0.[30] Participants evaluated the overall patient safety in their work units using a 4-point rating scale ranging from 1 (*poor*) to 4 (*excellent*).[31] Prior research has indicated that this single-item measure has strong psychometric properties.[31,32] The other outcome variable, *quality of care*, was measured using a single item asking participants to rate the overall quality of care delivered to patients in their units. Responses were rated on a 4-point rating scale ranging from 1 (*poor*) to 4 (*excellent*). This measure is widely used internationally[33,34] and has established predictive validity[27] and been used among Korean nurses.[31]

Demographic Information

Participants also provided information regarding their demographic characteristics, including age, gender, educational level, nursing experience, hospital tenure, unit tenure, and work unit.

Data Analysis

We used SPSS version 29.0 to compute the descriptive statistics and Pearson's bivariate correlations for the preliminary analyses. We evaluated the measurement and hypothesized models through confirmatory factor analysis (CFA) and SEM using Mplus version 7.0. The model fit was assessed using several indices: standardized root mean square residual (SRMR < 0.08), comparative fit index (CFI > 0.90), Tucker-Lewis index (TLI > 0.90), and root mean square error of approximation (RMSEA < 0.08).[35] When we determined the structural model, we controlled for age and unit tenure because they were significantly correlated with situation monitoring, patient safety, and quality of care. The significance of the indirect paths was tested using bootstrapping with 10,000 samples and 95% bias-corrected confidence intervals (CI) because an alternative method, the Sobel test, incorrectly assumes the normality of the indirect effect.[36]

Results

Sample Characteristics

As shown in Table 1, the sample mainly comprised female nurses (n = 352; 92.6%) with most having a bachelor's degree or higher (n = 353; 92.9%). The participants were working in medical-surgical, surgical, or critical care units and had a mean age of 30.20 years (*SD* = 7.42) with a mean of 6.39 years (*SD* = 7.23) of nursing experience. The mean tenure at the hospital was 5.99 years (*SD* = 7.26), and the mean tenure in their work unit was 3.86 years (*SD* = 4.38).

Preliminary Analyses

Table 2 shows the means, standard deviations, and Pearson's bivariate correlations for the predictor, mediating, and outcome variables. As expected, speaking-up climate was positively correlated with situation monitoring ($r = 0.588$, $p < 0.001$), patient safety ($r = 0.552$, $p < 0.001$), and quality of care ($r = 0.537$, $p < 0.001$). In addition, situation monitoring was positively correlated with patient safety ($r = 0.578$, $p < 0.001$) and quality of care ($r = 0.544$, $p < 0.001$).

Table 1 Demographic Characteristics of the Study Sample (N = 380)

Characteristic	Category	n (%)	*M* (*SD*)
Sex	Men	28 (7.37)	
	Women	352 (92.63)	
Educational level	Diploma	27 (7.11)	
	BSN or Higher	353 (92.89)	
Work unit	Medical-Surgical/Surgical	225 (59.21)	
	Critical Care	155 (40.79)	
Age (years)			30.20 (7.42)
Nursing experience (years)			6.39 (7.23)
Hospital tenure (years)			5.99 (7.26)
Unit tenure (years)			3.86 (4.38)

Abbreviations: *M*, mean; *SD*, standard deviation; BSN, Bachelor of Science in Nursing.

Table 2 Correlations, Means, and Standard Deviations for the Key Study Variables

Variable	1	2	3	4
1. Speaking-up climate	—			
2. Situation monitoring	0.588***	—		
3. Patient safety	0.552***	0.578***	—	
4. Quality of care	0.537***	0.544***	0.781***	—
Mean	3.42	3.71	2.58	2.59
Standard deviation	0.55	0.56	0.68	0.66

Notes: ***$p < 0.01$.

Hypothesis Testing

Measurement Model

Confirmatory factor analysis was performed to verify the discriminant validity of the four-factor measurement model. All observed variables had statistically significant loadings ranging from 0.448 to 0.846, exceeding the benchmark of 0.400.[37] The CFA results of the measurement model evaluation also showed an acceptable fit to the data, χ^2 (73) = 237.306, $p < 0.001$; CFI = 0.936, TLI = 0.920, SRMR = 0.050, and RMSEA = 0.077. This indicates that the measurement model fit the data acceptably.

Hypothesized Model

The SEM analysis of our hypothesized partial mediation model demonstrated a good model fit, χ^2 (97) = 293.774, $p < 0.001$; CFI = 0.924, TLI = 0.907, SRMR = 0.069, and RMSEA = 0.073. Figure 1 illustrates the standardized path coefficients for the variables used in this study, which were all significant. We then examined an alternative model, excluding the direct paths from speaking-up climate to the two outcome variables, to assess a full mediation model, which yielded an acceptable model fit, χ^2 (99) = 328.779, $p < 0.001$; CFI = 0.911, TLI = 0.893, RMSEA = 0.078, SRMR = 0.075. Finally, we conducted a chi-square difference test to compare the two models. The results confirmed that the partial mediation model had a significantly better fit than the full mediation model ($\Delta\chi^2 = 35.005$, $\Delta df = 2$, $p < 0.001$).

As shown in Figure 1, a speaking-up climate had a positive direct effect on patient safety ($\beta = 0.384$, $p < 0.001$) and quality of care ($\beta = 0.393$, $p < 0.001$), supporting Hypothesis 1. This indicates that environments where open communication is encouraged lead to better patient safety and higher quality of care. Moreover, the findings showed that a speaking-up climate was positively related to situation monitoring ($\beta = 0.684$, $p < 0.001$), supporting Hypothesis 2. This suggests that, when individuals feel free to voice concerns, they are more likely to engage in monitoring the situation to prevent errors. We also found that situation monitoring had a significant positive effect on both patient safety ($\beta = 0.328$, $p < 0.001$) and quality of care ($\beta = 0.272$, $p < 0.001$). These results support Hypothesis 3, indicating that heightened situation monitoring contributes to better patient safety and improved care quality.

We conducted a 10,000-sample bootstrap analysis to estimate the direct effects of speaking-up climate on patient safety and quality of care and assess its indirect effects on the two outcome variables through situation monitoring. The results indicated that all hypothesized indirect effects were significant with 95% CIs that did not include zero (see Table 3). This supports the partial mediation model and Hypothesis 4, which predicted the mediating effect of situational monitoring between speaking-up climate and patient safety and quality of care.

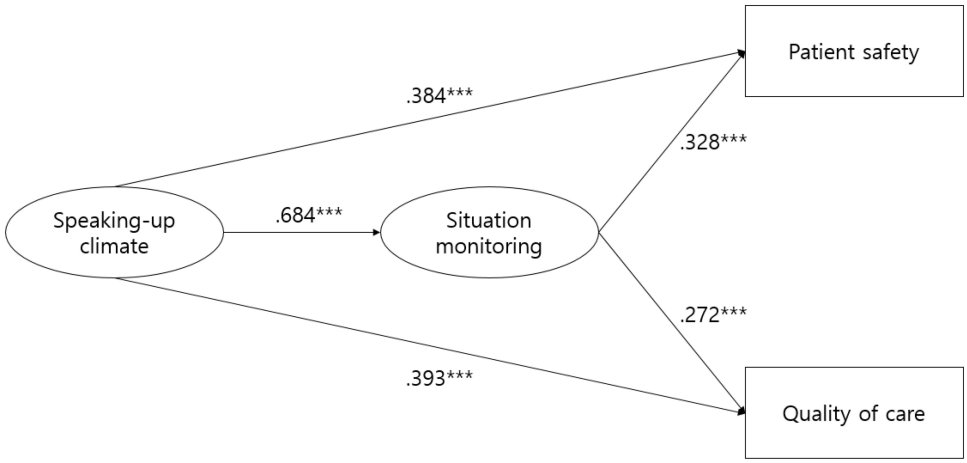

Figure 1 Structural equation modeling results of the hypothesized partial mediation model with standardized coefficient estimates.
Notes: ***$p < 0.001$.

Table 3 Standardized Direct and Indirect Effects for the Partial Mediation Model

Path	β	*p*	95% Bias-Corrected Confidence Interval [Lower, Upper]
Direct effects			
Speaking-up climate → patient safety	0.384	<0.001	[0.243, 0.524]
Speaking-up climate → quality of care	0.393	<0.001	[0.236, 0.550]
Indirect effects			
Speaking-up climate → situation monitoring → patient safety	0.224	<0.001	[0.119, 0.330]
Speaking-up climate → situation monitoring → quality of care	0.186	0.005	[0.062, 0.310]

Discussion

This study explored the impact of speaking-up climate on patient safety and quality of care with a focus on the mediating role of situation monitoring in these relationships. While fostering a climate that encourages voicing safety concerns has been widely recognized as conducive to speaking-up behavior among healthcare professionals, the relationship between such a climate and patient safety and quality of care has remained ambiguous.[2] Thus, the benefits of having a speaking-up environment for patient safety and quality of care remain unclear. This study used Donabedian's (1988) structure-process-outcome model to examine this gap in research to clarify why nursing organizations should attempt to improve the speaking-up climate.[18]

Our findings provide empirical evidence of the mediating role of situation monitoring, a key aspect of teamwork, in the relationship between speaking-up climate and patient safety and quality of care.[14] Our current findings were consistent with existing research emphasizing the positive impact of teamwork on patient safety and care quality; however, this study went a step further by identifying the role of situation monitoring as a mediator in the relationship between speaking-up climate, patient safety, and quality of care.[12,13] Our results also concur with previous studies illustrating the usefulness of Donabedian's model for assessing healthcare quality in general.[38]

Our study's mediation analysis highlights the importance of situation monitoring, which has rarely been investigated in patient safety literature. In other words, an improved climate for speaking up can benefit patient safety and quality of care by facilitating team members' situation awareness and shared mental models—the two components of situation monitoring. Information-sharing between colleagues with differing levels of experience can enhance a team's overall situation awareness.[39] Better situation awareness empowers nurses to implement effective interventions and make appropriate decisions to prevent such incidents.[40] For instance, a recent study suggested that nurses with high situation awareness identified several factors that could potentially cause patient falls.[41] Furthermore, when individuals communicate and interact, their mental models often align over time, resulting in shared mental models.[42] These shared mental models help team members have similar views of the team's task, set goals for accomplishing that task, and develop appropriate strategies for approaching the task.[43]

Our study also found that a speaking-up climate had a direct influence on patient safety and quality of care, even after accounting for the mediating effects of situation monitoring. A speaking-up climate increases instances of healthcare professionals voicing their concerns, and our findings showing the direct link between speaking-up climate, patient safety, and quality of care underscore the importance of improving a speaking-up climate in healthcare organizations.[2]

Previous research found that the most common reasons for not speaking up among healthcare workers were the fear of retaliation, the belief that no changes would be made, and organizational leaders' disregard for others' opinions.[3] Therefore, implementing open leadership, such as inclusive and empowering leadership, that encourages and values employees' opinions is critical for fostering a speaking-up climate, which reduces fears of reprisal for speaking up. Specifically, having senior management support unit leaders in targeted training related to open leadership, establishing an electronic reporting system, and scheduling regular debriefings to discuss habits would be helpful for the process.[3] In addition to leadership factors, team-based communication training, which increases the frequency of interactions within teams, has been shown to reduce the burden of speaking up.[16] Further, support from hospital leadership that does not blame individuals fosters an environment of speaking up.[17,44]

While this study offers novel insights into the relationships between a speaking-up climate, situation monitoring, patient safety, and quality of care, it has some limitations. First, the use of self-report instruments measured in a cross-sectional survey may be subject to various biases, such as social desirability and common method biases. Second, we used a convenience sampling method; thus, the participants may not be a representative sample of nurses, limiting the generalizability of our findings without any replication studies. In addition, although we used a long-validated structure-process-outcome model proposed by Donabedian (1988), the nature of this study's cross-sectional design restricts its ability to make conclusive inferences about causality.[13]

Conclusion

This study underscores the crucial role of fostering a speaking-up climate in enhancing situation monitoring, which, in turn, improves patient safety and the quality of care. This study has clarified the mediating role of situational monitoring between a speaking-up climate and safety and quality outcomes. In practical terms, it shows that healthcare teams can achieve better situation awareness and develop shared mental models by creating an environment where nurses feel comfortable voicing their concerns, leading to enhanced patient safety and quality of care. Therefore, healthcare organizations should invest in leadership training that promotes open and inclusive leadership styles and regular team debriefings to encourage open communication. Future research should focus on longitudinal studies to establish causal relationships, use diverse sampling methods to enhance generalizability, and explore other mediating factors that might influence the outcomes.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising, or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Funding

This study was supported by a National Research Foundation of Korea grant funded by the Korean Government (MSIT) (No. RS-2023-00208138).

Disclosure

The authors report no conflicts of interest in this work.

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