Understanding the peer, manager, and system influence on patient safety

A unique view of the Hospital Survey on Patient Safety Culture

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The aim to achieve zero preventable harm in healthcare systems remains an important but elusive goal.[1] Recent reports suggest that medical error is the third leading cause of death in the US.[2] As healthcare organizations have increased their focus on implementing tactics to improve patient safety, there remains doubt about their effectiveness.[3] One intervention that has shown promise for decreasing errors in health systems is the assessment of organizational perceptions of patient safety culture and subsequent strategies to address findings.

Perceptions of patient safety culture link the beliefs, values, and norms shared by staff in an organization with actual patient safety.[4] Measuring perceptions of safety culture can raise staff awareness about patient safety, assess the current status of patient safety culture, and support comparisons within and across organizations.[4] One of the primary tools used to measure safety culture in US healthcare organizations is the Hospital Survey on Patient

Safety Culture (HSOPSC), developed by the Agency for Healthcare Research and Quality. The HSOPSC can be administered to all hospital staff and physicians but is best suited for those who have direct contact with patients or whose work directly affects patients.[4]

An area of continued underperformance on the HSOPSC is the nonpunitive response to error domain. In 2018, the nonpunitive response to error domain had the lowest percent positive response (47% positive) across all organizations that participated in the survey.[5] Despite

nurse leader with frontline nursing staff is linked with patient safety.[8] Although the nurse leader's role in promoting safety is well defined, understanding how interactions with peers, managers, and the broad system promote patient safety isn't well understood. Research using the HSOPSC to understand perceptions of safety culture among nurses has primarily focused on measuring perceptions at an individual, unit, or hospital level, but none have used the HSOPSC to explain which level is the greatest contributor to patient safety perceptions and nonpunitive response to error.[9]

hospitals. The dataset contained 1,072 participants. The study sample included only nurses who indicated that they worked in a direct patient care area. The study received Institutional Review Board approval before data analysis. The data used in this analysis were deidentified before the study team gained access.

The HSOPSC contains 42 items grouped into 12 composites that assess patient safety culture in hospitals.[5,10] The survey also contains two items that assess the overall grade of patient safety and ask the participant to indicate

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the importance of creating an environment that promotes error reporting, hospitals continue to have difficulty improving staff perceptions that they won't be punished when mistakes are made.[1] Reporting errors depends on frontline staff trusting that leaders want to know errors occur and, when reported, will implement effective improvements.[6] When errors occur, the events that led to the mistake and the impact on safe care should be shared so strategies can be implemented that may prevent reoccurrence.[7]

Nurse leaders play a key role in creating a positive patient safety culture in hospitals. The day-to-day work and interaction of the

Therefore, the purpose of this study was to describe the peer, manager, and system influence on perceptions of patient safety as predictors of unit grade and perceptions of nonpunitive response to errors as reported on the HSOPSC.

Method
This study used a secondary descriptive analysis of a deidentified HSOPSC dataset from one regional healthcare system located in the Southeastern US to understand how nurses' perceptions of patient safety are shaped by peers, managers, and system factors. The health system has one tertiary medical center and seven community

the number of events reported over the past 12 months.[4] The HSOPSC has been shown to have acceptable psychometric properties with the exception of the staffing dimension, which was retained due to its theoretical importance on patient safety.[4]

Analysis
Researchers used a modified Delphi method to recategorize the HSOPSC according to three new composites that reflected peer, manager, and system influences on patient safety and nonpunitive response to error. Each member of the research team used knowledge from a previous qualitative study conducted at the same organization to assign

each HSOPSC item to either the peer, manager, or system category as described by nurses in the previous study. The unit grade and number of events reported weren't included in the categorization. Individual categorizations were compared for agreement. Research team members met to discuss items with disagreement and reach consensus on final item categories.

Eight of the 39 items (21%) were categorized as being peer-influenced. This dimension included items such as "People support one another on this unit" and "It's often unpleasant to work with staff from other hospital units." Twenty-five of the 39 items (64%) were categorized as being manager-influenced. These included items such as "We have enough staff to handle the workload" and "Staff feel like their mistakes are held against them." Six items (15%) were categorized as being system-influenced. This included "Our procedures and systems are good at preventing errors from happening" and "Things 'fall between the cracks' when transferring patients from one unit to another."

The dataset was entered into statistical software for analysis.[11] Response frequencies were conducted to identify outliers and missing data. Negatively worded items were reverse coded. Descriptive statistics were used to summarize individual item characteristics. Multiple regression was used to identify the strongest predictors and corresponding category of the nonpunitive response to error composite. Logistic regression (LR) was done to determine which items and corresponding category were the best predictors of an A or B grade for overall unit patient safety.

Results
Characteristics of the sample were limited to the variables collected in the HSOPSC. (See *Table 1*.) Most participants (N = 1,072) had worked in their hospital for 1 to 5 years (37%) or 6 to 10 years (21%). Similarly, a majority of nurses (41%) reported working on their current unit for 1 to 5 years. Nearly all participants reported providing direct patient care (99%).

Table 1: Participant characteristics (N = 1,072)

Variable	n	%
Tenure in hospital (years)		
<1	192	18
1–5	392	37
6–10	226	21
11–15	126	12
16–20	59	6
≥21	71	7
Missing	6	<1
Tenure in current unit (years)		
<1	241	23
1–5	441	41
6–10	201	19
11–15	104	10
16–20	41	4
>21	38	4
Missing	6	<1
Tenure in current specialty/profession (years)		
<1	134	13
1–5	362	34
6–10	225	21
11–15	123	12
16–20	87	8
>21	127	12
Missing	14	1
Provide direct patient contact		
Yes	1,057	99
No	7	1
Missing	8	<1

Note: Totals of percentages aren't 100 for every characteristic due to rounding.

Unit grade. All 39 items were entered into the LR model. The results of the Hosmer–Lemeshow test (χ^2 = 6.579, df = 8, P = .583) told us how well our data fit the LR model of predicting a unit grade of A/B. For this statistic, a good fit is indicated by a P value of greater than .05. The model correctly classified 87.9% of cases. Sensitivity was 89.8%, specificity was 82.5%, positive predictive value was 93.7%, and negative predictive value was 73.8%.

Of the 39 items, eight were statistically significant predictors of A/B grades. (See *Table 2.*) Four items were in the manager category, three in the peer category, and one was a system factor. The strongest predictor of reporting a unit grade of A or B was "We have patient safety problems on this unit," recording an odds ratio (OR) of 4.07. In the survey this is a negatively worded item, which indicates that participants who disagreed with this item were over four times more likely to report a unit grade of A or B compared with participants who agreed with the item. The next strongest predictor (OR = 3.25) was a peer item, "People support one another on this unit."

Nonpunitive response to error. All items were also entered into the multiple regression model to explore nonpunitive response to error. Two variables were identified as potential outliers but were left in the model due to not affecting the results as determined by Cook's distance with a maximum value of .038, which is less than the criterion value of 1.0. A value of greater than 1.0 would suggest that one or more cases could be affecting the result. The multiple regression model significantly predicted nonpunitive response to error (F[36,880] = 19.80, P < .001, adjusted coefficient of determi-nation [R^2] = .425). Ten items showed statistical significance for explaining the variability in nonpunitive response to error. Of the 10 items, nine were categorized as manager factors and one as a peer factor. No items in the system category were significant in explaining the variability in nonpunitive response to error dimension. *Table 3* shows the regression coefficients and categories for the item that were statistically significant.

Discussion

The findings from this study show that manager- and peer-level factors have a greater influence on clinical nurses' perceptions of patient safety. Furthermore, the manager has an overwhelming influence on clinical nurses' perceptions of nonpunitive response to error. This study enhances the need for strategies focused on improving relationships at the

Table 2: LR predicting the probability of unit grade A/B

Item statement	B	Standard error	OR	95% confidence interval	Wald statistic	P	Category
1. We have patient safety problems on this unit.	1.40	.26	4.07	[2.45, 6.77]	2.86	<.001	Manager
2. People support one another on this unit.	1.18	.48	3.25	[1.28, 8.27]	6.15	.013	Peer
3. We're actively doing things to improve patient safety.	1.02	.37	2.79	[1.36, 5.73	7.84	.005	Manager
4. Our procedures and systems are good at preventing errors from happening.	.92	.27	2.50	[1.49, 4.22]	11.88	.001	System
5. Hospital management provides a work climate that promotes patient safety.	.91	.30	2.49	[1.39, 4.46]	9.40	.002	Manager
6. Staff will freely speak up if they see something that may negatively affect patient care.	.88	.28	2.41	[1.40, 4.14]	10.14	.001	Peer
7. When one area on this unit gets really busy, others help out.	.83	.29	2.29	[1.30, 4.05]	8.14	.004	Peer
8. Staff are afraid to ask questions when something doesn't seem right.	.72	25	2.06	[1.27, 3.34]	8.66	.003	Manager

Table 3: LR predicting the variability in nonpunitive response to error

Item statement	B	Standard error	β	t	P	Category
1. Staff feel free to question the decisions or actions of those with more authority.	.171	.033	0.197	5.21	<.001	Manager
2. We work in "crisis mode" trying to do too much too quickly.	.151	.031	0.181	4.96	<.001	Manager
3. My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures.	.153	.039	0.166	3.95	<.001	Manager
4. Mistakes have led to positive change here.	.164	.037	0.149	4.57	<.001	Manager
5. On this unit, we discuss ways to prevent errors from happening again.	.112	.044	0.109	2.53	.011	Manager
6. Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts.	.113	.038	0.105	2.98	.003	Manager
7. Staff are afraid to ask questions when something doesn't seem right.	.090	.030	0.096	2.99	.003	Manager
8. We're actively doing things to improve patient safety.	.104	.043	0.089	2.40	.016	Manager
9. When one area on this unit gets really busy, others help out.	.068	.034	0.072	2.00	.046	Peer
10. Hospital management seems interested in patient safety only after an adverse event happens.	.063	.028	0.077	2.29	.022	Manager

Note: R^2 = .45 (N = 1,072, $P < .001$)

manager and peer level in addition to system-level strategies.

This study supports findings from our previous qualitative study that informed how we categorized items in the HSOPSC to reflect peer, manager, or system perceptions. Participants in that study described the importance of manager and peer relations in the development of their perceptions of patient safety. Our findings also support previous research that positive perceptions of relationships with managers among clinical nurses translated into positive patient safety and outcomes.[12]

Our study has provided substantial support for the nurse manager's role in creating a nonpunitive response to error culture.[13-15] The nurse manager is well prepared and positioned to implement safety culture improvements that create an environment of nonpunitive

response to error. In this study, the strongest predictors of variability in nonpunitive response to error were "Staff feel free to question the decisions or actions of those with more authority," "We work in crisis mode trying to do too much too quickly," "My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures," and "Mistakes have led to positive change here." When managers provide a strong concern for patient safety and positively reinforce staff for doing the "right thing," it results in a more positive perception of nonpunitive response to error. This supports other findings that emphasize the importance of the nurse manager's influence on staff speaking up freely when errors occur.[16] Managers can ask staff members for their safety concerns and share findings

from the review of harmful events that occur. This feedback loop demonstrates willingness to address concerns and transparency in sharing results of event reporting. Creating an environment where staff members are free to report errors is the foundation for a safe patient environment.

The overall patient safety grade nurses assigned to their unit was somewhat equally influenced by manager and peer factors. Similar to overall perceptions of patient safety, the manager's promotion of patient safety through speaking up and actively doing things to improve patient safety was a strong predictor of overall patient safety grade. Peer influence centered around supporting one another when patient care is busy. Nurses don't want to work in a silo and prefer collaboration to improve patient safety.

Many studies have focused on the relationship with peers and patient safety through the lens of lateral aggression and workplace bullying.[17,18] Further research is necessary to provide insight into the nuances of the nurse-to-nurse relationship that contribute to patient safety beyond the extremes of aggressive and bullying behavior.

Limitations

This study is a secondary analysis of a dataset collected using a national tool to assess patient safety culture. This research was limited to the variables originally collected. This limited our ability to describe the sample in detail or provide demographics of the nurses included in this analysis. The nature by which we categorized the original HSOPSC items also has limitations. Researchers were unable to validate categorizations with participants in the original qualitative study that informed this study design. The researchers have attempted to outline a process that provides a unique perspective on interpreting the HSOPSC while creating a logical progression of inquiry from a qualitative to quantitative understanding of patient safety culture.

The importance of relationships

This study supports the strong influence of nurse managers and peers on creating environments that promote patient safety and nonpunitive response to error. By focusing on strategies that emphasize the role of nurse manager and peer relationships, in addition to system-wide safety strategies, organizations are more likely to see gains in safety culture.

Although the relationship between the nurse manager and patient safety has been a popular area of investigation, this is one of the first studies to use the HSOPSC to link the nurse manager and peers to the importance of unit patient safety culture and nonpunitive response to error. Organizational leaders, managers, and staff must recognize that each has a role in creating a safe patient care environment. Strategies focused on improving patient safety can't rely solely on broad organizational tactics, but rather should acknowledge the foundational importance of building relationships that promote open reporting and collegial interactions of nurse peers and their managers. NM

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