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Perceptions of Safety Culture and Patient Safety Events

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ABSTRACT

In order to preserve a culture of safety, inpatient care teams in hospitals need to be able to communicate effectively with one another. The purpose of this research was to investigate the relationship between the perceptions of patient safety culture and the number of safety incidents that occur in hospitals. With Schein's organizational culture model serving as a guide, researchers were able to find the connections they had hypothesized should exist between certain aspects of safety culture and actual accidents. Both the Materials and the Procedures are: The research team was successful in gaining access to the opinions of a substantial number of clinical teams regarding their safety culture.

It was discovered that handoffs and transitions were a significant predictor of the reduction of safety occurrences, in contrast to other predictors, which were not found to be significant. The implications for the research on communication within clinical teams are emphasized here. In conclusion, a discussion of the data findings and a presentation of the implications that these findings have for the variables are given. The implications for healthcare teams in terms of the actions that individual team members will take in the future are also emphasized here. The directions that future research should take are suggested.

KEYWORDS: Clinical teams, Hospitals, Patient SafetyCulture, Safety Events

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INTRODUCTION

The corporate culture of hospitals must place a significant emphasis on the protection of their patients. The members of an organization have opinions about what they and others in their organization value, as well as how members of their organization should think and behave. These opinions give rise to the existence of organizational culture. Members contribute to the formation and maintenance of culture in their organizations through the attitudes, beliefs, activities, and relationships they maintain. For instance, the manner in which clinical teams in hospitals address safety issues generates expectations for behavior by demonstrating which actions and attitudes are valued and which are not as important as the former (1). This study investigates the relationship between the safety culture of inpatient clinical teams and the incidence of safety incidents in hospitals. It is a novel idea to look into the connection that exists between these different factors. The majority of inferences are established using insurance claims and incident reports as their sources of supporting data. By establishing a connection between safety culture and safety events, measurable variables can be made more readily available prior to the occurrence of accidents. A wide variety of unfavorable or potentially hazardous occurrences that take place while a patient is in the care of a clinical team are referred to as "safety events" in hospitals. These events can take place at any time during the course of a patient's treatment (2). Patient falls, errors in medication administration, and the development of pressure ulcers are some examples of safety incidents that can occur. To begin, let's discuss what organizational culture and safety culture are. The next part of this discussion will focus on the aspects of a hospital's safety culture that relate to communication and relationships, as well as how these aspects are connected to incidents that occur in hospitals. By gaining an understanding of the relationships between cultural factors and safety occurrences, hospitals will be better equipped to identify those cultural factors that have a disproportionate amount of influence and to work toward improving those factors whenever it is practicable to do so.

Perceptions of Safety Culture and Patient Safety Events

Hospitals Have a Culture of Safety

The beliefs, attitudes, and behaviors that individuals in an organization agree on, sometimes implicitly, make up what is known as the organization's organizational culture (3). The culture of patient safety in hospitals is comparable to the culture of an organization, but its primary focus is on the degree to which the culture supports efforts to "[minimize] patient damage that may emerge from the process of care delivery" (4). It is essential to one's ability to maintain safety to have a solid understanding of the safety culture of high-risk industries such as hospitals. The fifth culture model provides a theoretical framework for the investigation of organizational culture. Artifacts, espoused ideals, and fundamental assumptions are the three levels that make up the concept. These levels are distinct from one another but are connected. The most obvious level of culture is represented by artifacts, which include aspects such as the architecture of buildings, the type of office, warehouse, or manufacturing space in which the organization is based, as well as what is displayed (or not displayed) in workspaces. A company's publicly declared beliefs about what is most important to the company are known as its "espoused values." They are frequently articulated in written documents such as a goal statement or policy, which specify which forms of behavior are expected or discouraged in the organization. Basic assumptions are cultural beliefs that are so firmly established at the third and deepest level of culture that members of the organization may not even be able to express them. This is because basic assumptions are located at the third level of culture.

This study investigates the safety culture of an expansive hospital network by analyzing the artifacts used and the values espoused by staff members working on inpatient care teams. For the purpose of gaining insight into the values held by members of the inpatient care team, we make use of a tool known as the Hospital Survey on Patient Safety Culture (HSOPS). The HSOPS is considered an artifact because it demonstrates how critically important safety is to this particular healthcare system. With the help of HSOPS responses, we propose connections between different aspects of the officially proclaimed safety culture and safety events.

Safety events, which are defined as a broad range of unfavorable or potentially dangerous occurrences that take place while a patient is under the care of a clinical team, serve as an indicator of patient safety in hospitals. These events take place while a patient is receiving treatment from a clinical team (2). Hospitals consistently strive to improve their patient safety record. The presence of safety events is reliant on the safety culture that surrounds a particular clinical team. This is due to the fact that the safety culture is likely to have an impact on how the clinical team completes their work. Cultures of Communication and Risk Management

Two aspects of the safety culture that have the potential to have an effect on the occurrence of adverse events are communication and connections among members of the clinical team. To begin, it is essential for clinical teams to communicate with one another in order to reduce the number of adverse events. Communication is the process by which members of the team exchange information with one another and provide and receive feedback on their performances (6). Sharing information and soliciting feedback is yet another important method of communication. This entails the action taken in reaction to an incident involving safety or a potential problem. The potential for the unit to improve is directly proportional to the degree to which the answer, rather than punishing people, encourages people to debate and collaborate in order to get better.

The HSOPS elicits values that are expressed regarding aspects of safety culture that are related to the communication that occurs within clinical teams. The extent to which these communication elements are valued should indicate the presence of a safety culture that encourages problem solutions that may lead to safety events, thereby reducing the number of times safety occurrences take place. The following provides a definition of each facet, followed by a rationale and a hypothesis for its use.

First, the response to a safety occurrence is the focus of both feedback and error communication. Concerns have been raised regarding the frequency with which individuals are informed of errors and modifications made as a result of safety event reports, as well as the frequency with which errors are discussed in an effort to prevent them from occurring again. It is not the most desirable activity to talk about safety occurrences, which is consistent with the way of thinking that says people are aware of how they show themselves to others (7). It was discovered that medical residents and faculty believed that reporting errors, regardless of how minor or severe they were, was the appropriate action to take. This was the case even though doing so could make themselves or their team look terrible. On the other hand, residents and teachers were less likely to report minor and major safety incidents when they occurred. This was true for both types of incidents. In light of concerns regarding self-presentation, the ability to remain anonymous while reporting safety concerns appears to be beneficial in increasing the number of people who report incidents (9). Be sure to stress that the MEDMARX system, which is used to collect reports of drug errors from hospitals all over the country, is "an anonymous, confidential, de-identified...reporting scheme" (p. 486). (10). Goffman's theories were applied to acute care hospital wards, mixing Goffman's front and back phases with scheduled and impromptu exchanges. This was done in order to better understand how people interact in these settings. Lewin and Reeves considered interactions that took place backstage to be both prearranged (such as during meetings) and impromptu (e.g., catching up in the hallway). The discussion of errors should probably take place behind the scenes, away from the ears of patients and the members of their families. However, when they are "backstage," the level of comfort a clinical team has in discussing errors and how to fix those errors is likely to affect outcomes; more specifically, the likelihood of safety

incidents decreasing has the potential to increase if the culture is open to discussing errors.

When healthcare professionals place a high value on receiving feedback and communicating openly about errors, the number of safety incidents will decrease.

Second, the phrase "communication openness" refers to the degree to which employees feel at ease speaking up when they become aware of potential problems. In an environment that is more open, workers are more willing to share information with one another (11). It was found that when employees perceived their supervisor as being open to communication, they experienced a greater sense of psychological protection and were more willing to use their voice to assist in making the organization better (12). It was also demonstrated that the culture of an organization has an effect on the propensity of its employees to speak up. During a series of interviews focused on dissent-related supervisors (13), a common theme of supervisors not accepting dissent was identified. This was especially true for respondents working in health care contexts. The findings of Garner cause one to wonder whether or not transparency will be valued on healthcare teams. We expect that the perceptions of openness in clinical teams will have the ability to prevent potential safety incidents.

When workers have a positive outlook on the openness of communication, there will be a reduction in the number of safety incidents.

Third, handoffs and transitions refer to the movement of patients by personnel, either between units or during shift changes. They also refer to the percentage of successful patient transfers during these handoffs and transitions (14). One of the most frequently cited causes of transitional errors was misunderstandings or ineffective communication (15). One aspect of transitions known as medication reconciliation needs what is known as a "culture of accountability" in order to be successful (p. e48). To put it another way, everyone who is involved in a transition needs to take responsibility for successfully completing the pharmaceutical reconciliation. This demonstrates that changes in cultural attitudes are an essential component of any transformation. If handoffs and transitions are highly valued as events, then the additional care that personnel will take to ensure that they are handled correctly should result in a reduction in the number of safety incidents that occur.

When employees place a high value on handoffs and transitions, there will be a reduction in the number of safety incidents. Fourth, the perception of the extent to which people "get in trouble" or are blamed for mistakes they may have committed, such as receiving a written reprimand or having the mistake logged in their personnel file. When someone is blamed for something, it makes them defensive and decreases the likelihood that other members of the team will discuss and correct the issue. When (16) investigated errors that had been made by multiple teams, for example, they found some mixed outcomes regarding responsibility. They made the observation that while placing blame was linked to elevated levels of responsibility and accountability, it also had the potential to increase levels of defensiveness and close-mindedness. This was especially obvious in situations where blame was assigned in a covert manner (17).

It was reported as a barrier to reporting by doctors and nurses that the fear of being wrongfully blamed for poor outcomes, as well as the fear of getting in trouble, was a factor; however, the latter concern was ranked lower. If a nonpunitive response to error is widely acknowledged as an important component of safety culture, then it should be much simpler to prevent safety incidents from occurring.

When employees have a high opinion of how nonpunitive responses to errors are handled, there will be fewer incidents involving safety. Last but not least, the frequency of occurrences recorded describes the rate at which "near misses" are documented as being safety events. When an error is made, but it is not anticipated to have any negative consequences, how frequently do members of the staff claim that they report safety occurrences that did not result in any harm? For instance, (18) found that increasing the amount of correct reporting education provided to Emergency Residents led to an increase in the number of occurrences that were recorded. The frequency of occurrences is a measurement of the communication environment that exists within a healthcare team (19).

It was found that the frequency of reports increased when teams included reporting rules as part of their day-to-day responsibilities. That is to say, the frequency of reporting became a concern shared by the entire team, which made it possible for reporting to become a cultural norm. When workers rate the frequency of reported occurrences as high, there will be fewer safety issues. This is the hypothesis presented in Hypothesis 5.

Safety Culture and Relationships

Relationships are another facet of safety culture that can play a role in determining the frequency of accidents and near misses. These include how well employees feel supported by their immediate supervisor and top management, as well as how well a clinical team works together and with those in other units. How well employees feel supported by their immediate supervisor and top management is also included.

The clinical team members' perceptions of the various linkages between safety and quality of care are an important indicator of the culture of safety. It's possible that different interactions within and between units will leave different clinical team members with varying impressions of their hospital's overall safety culture. It is likely that there will be a reduction in the number of safety incidents if upper management and supervisors are successful in training team members to collaborate and communicate with one another. One's impression of the safety culture can be improved as a result of this factor. A possible explanation for the decline in the number of safety incidents is the increased collaboration and communication efforts made by management.

The degree to which members of a team support and

respect one another, as well as the degree to which they are willing to assist one another in completing their collective work, is referred to as the level of teamwork that exists within the unit. For instance, (20) found that when nurses perceived a high level of teamwork among units, they reported a higher overall rate of safety incidents. [Citation needed] [Citation needed] This demonstrates a willingness to support and encourage one another, even when potentially dangerous circumstances arise. In a study that came to a similar conclusion, (21) found that when there was a high level of teamwork within units, hospital staff members were more likely to consider handoffs to be effective. To put it another way, the presence of cooperation improved perceptions of other actions taken to ensure patient safety within the culture. As a consequence of this, the number of safety incidents should drop for the units if the teamwork that exists between them is deemed to be effective.

When personnel have a positive perception of the unit's teamwork, there will be fewer incidents related to safety.

The term "teamwork across units" refers to the sense that different units, which are required to work together to provide care for patients, are coordinating their efforts and cooperating with one another (22). It was discovered that nurses' attitudes toward patient safety competency were significantly connected to their perceptions of cross-unit teamwork; however, these perceptions were not connected to the nurses' knowledge or abilities. This gave rise to the argument that, in order for a culture of safety to be maintained across units, it must first and foremost be a priority within each individual unit. In a similar vein, if members of a team consider the collaboration between different units to be positive, they should notice a reduction in the number of safety incidents.

When employees from different units work together effectively, H7 predicts that there will be fewer instances of unsafe behavior. The extent to which supervisors are viewed as firmly supporting safety rather than advocating for faster work through shortcuts or disregarding recurring patient safety problems is used to describe the supervisor or manager expectations and actions that promote patient safety (23).

It was discovered that the expectations of managers and the actions they took to promote patient safety had a significant and unfavorable link with surgical site infections (SSI). The authors believe that the administration of the hospital plays a significant part in preserving a culture that prioritizes the safety of patients. Similarly, there should be a reduction in the number of safety incidents experienced by team members if they have the perception that there are high levels of expectations for and activities promoting safety culture.

It is hypothesized that the number of incidents related to patient safety will decrease when personnel give a high level of value to the expectations and actions of supervisors and managers aimed at promoting patient safety.

Management support for patient safety can be defined as the degree to which senior management is seen as prioritizing safety and creating a safe environment rather than being concerned with safety only after an unfavorable event has taken place. This is in contrast to the view that management only becomes concerned with safety after an unfavorable event has taken place. (24) Found that their research on clinical practitioners' opinions regarding patient safety factors in their own institution had many methodological flaws. One of the nine problems, which included management support for patient safety, was one of the most serious. In order to achieve the goal of improving people's perceptions of the safety culture, this was determined to be a problem area. To put it another way, if management does not provide adequate support, clinical teams' perspectives on safety behaviors may be affected, and ultimately, so may their actions. As a consequence of this, team members should anticipate fewer safety incidents if they feel that strong management support is being provided for patient safety. When management support for patient safety is positively rated by personnel, there will be fewer safety incidents. This is the hypothesis presented in Hypothesis 9 (H9).

MATERIALS AND METHODS

Participants

The sample for this research project consisted of 1,183 employees drawn from 39 clinical teams located across five different locations. Medical city is a medical facility that provides services to more than 3 million patients annually.

A total of thirteen hospitals, two research facilities, a health insurance plan, and the School of Medicine are included in the Health System. The primary work location of a hospital employee is used to determine membership in a clinical team.

This sample includes clinical teams from medical-surgical inpatient units (29 teams totaling 825 respondents), intensive and specialty care units (7 teams totaling 268 respondents), as well as labor and delivery units (3 teams, 90 respondents).

In order to carry out their responsibilities, nurses, technicians, medical assistants, and unit desk clerks are each assigned to a specific hospital unit. Together, these employees form the constant work team for the unit, which is represented by the teams in this example. Physicians, resident physicians, and mid-level clinical providers (such as nurse practitioners and physician assistants) are not included in the sample because of the transient nature of their positions. It is not typical for physicians and mid-level providers to spend their entire workdays with a single inpatient team because they provide care for patients across multiple inpatient units.

They are excluded from this sample as a result of the fact that the roles that they play in relation to each unit are significantly distinct from those that are played by the consistent work team.

The results of the survey showed that 98 percent of the sample's respondents said they have direct and regular contact with their patients. 41% of respondents did not disclose a

single patient safety occurrence during the previous 12 months, 30% reported 1-2 events, 18% reported 3-5 events, and 11% reported more than 5 events. The various characteristics of the hospitals and clinical teams are outlined in Table 1

Table 1. Characteristics of Hospitals and Teams that Comprise the 1,183 Survey Respondents

Hospital	Bed size category	eaching status	Number of inpatient teams	Total number of survey respondents	Mean (Range) of survey respondents per team
Hosp 1	<200	Non-teaching	3	67	22.3 (17-30)
Hosp 2	200-299	Non-teaching	8	194	24.3 (8-37)
Hosp 3	<200	Non-teaching	5	114	22.8 (9-32)
Hosp 4	≥500	Teaching	16	607	37.9 (16-65)
Hosp 5	200-299	Non-teaching	7	201	28.7 (12-61)

Survey Instrument

The AHRQ Hospital Survey on Patient Safety Culture (HSOPS) is a well-established and psychometrically validated questionnaire designed to evaluate hospital safety cultures. It was developed by the Agency for Healthcare Research and Quality (25). This device is the benchmark for determining whether or not a patient is safe. The very first version of HSOPS was made available in the year 2004. Every hospital in the world has unrestricted access to it. A web-based survey is carried out by the health Center once every two years. The survey is completely voluntary and participants will remain anonymous. October 2019 was the month during which the data for this study were collected. The HSOPS evaluates twelve different patient safety characteristics, and each of these characteristics is comprised of three to four different survey items. The HSOPS items all use the same Likert scale, which ranges from 1 to 5, with 3 denoting a response that is neither positive nor negative and the other possible scores (1, 2, 4, 5) depending on how the item is phrased (i.e., whether each item is reverse coded or not). The scores on the items were averaged so that composite variables could be generated for the analysis. In order to construct the unit level analysis (N=39), an average score was first determined for each individual respondent, and then an average score was determined for all respondents within each unit.

Primary Predictor Variables

Participants were asked to complete a three-item, five-point Likert subscale from the HSOPS (Cronbach's alpha =.77; see also) (25) in order to evaluate feedback and communication regarding errors. The participants provided their responses to statements such as "We are informed about errors that occur in this unit" and "In this unit, we explore solutions to prevent errors from occurring in the future." A higher score indicates that the respondent believes there is a greater frequency of feedback and communication of mistakes. The HSOPS's communication openness was assessed using a three-time, five-point Likert subscale (Cronbach's alpha =.58; cf) (25). Participants reacted to statements such as "Staff feel free to challenge those with higher authority's decisions or actions" and "Staff are reluctant to ask questions when something does not look right." Higher scores imply a more open communication style.

For the purpose of evaluating handoffs and transitions, participants completed a four-item, five-point Likert subscale from the HSOPS (Cronbach's alpha =.75; see also) (25). Participants provided responses to statements such as "Problems in the interchange of information among hospital units occur frequently." and "Important patient care information is frequently lost during shift changes." A higher score indicates that the respondent believes that the exchange of information is difficult.

The participants filled out a three-item, five-point Likert subscale from the HSOPS (Cronbach's alpha =.75; cf.), which was used to evaluate nonpunitive responses to errors (25). Statements such as "Staff feel like their mistakes are held against them" and "When an occurrence is reported, it feels like the person, not the problem, is being written up" elicited responses from the participants. The belief that mistakes are held against workers and that mistakes are the fault of the staff rather than the procedure is reflected in ratings that are higher than those ratings.

Participants were asked to complete a 3-item, 5-point Likert subscale from the HSOPS (Cronbach's alpha =.0.78; cf.) in order to evaluate the number of incidents that were documented (25). Questions such as "How often is a mistake made but recognized and fixed before hurting the patient?" were posed to the participants, and they provided their responses. The higher the score, the more likely it is that the respondent believes that near misses occur more frequently. The participants filled out a four-item, five-point Likert subscale from the HSOPS to evaluate the level of collaboration within their respective units (Cronbach's alpha = 0.79; cf) (25). Items that were included in the weighing system were statements such as "People in this unit encourage one another" and "When one section in this unit gets particularly crowded, others help out." A higher rating indicates that the individual teams within the unit experience a greater sense of support and cooperation. The participants filled out a 4-item, 5-point Likert subscale from the HSOPS to evaluate their participation in cross-unit teamwork (the Cronbach's alpha for this scale was 0.68; cf) (25). According to the scale, "There is good coordination among hospital units

that need to operate together," and "Hospital units work well together to give the greatest treatment for patients." "There is good coordination among hospital units that need to operate together." The higher the scores, the more likely it is that there was strong cross-unit cooperation among the teams. Participants completed a four-item, five-point Likert subscale from the HSOPS (Cronbach's alpha = 0.70; cf.) to evaluate the expectations of supervisors or management in terms of patient safety and the actions they take to promote it (25).

Two of the items that were included on the scale were, "My supervisor/manager offers a positive word when he/she observes a job done according to established patient safety protocols," and "My supervisor/manager seriously considers staff proposals for increasing patient safety." A higher rating suggests that the manager provides a stronger support system and takes additional measures to promote safety.

In order to evaluate managerial support for patient safety, participants completed a three-item, five-point Likert subscale from the HSOPS (Cronbach's alpha = 0.71; cf) (25). The scale included statements such as "Hospital administration cultivates a working environment that supports patient safety," and "Hospital management's actions demonstrate that patient safety is a top priority." If the rating is higher, it indicates that the higher management is thought to be more supportive of patient safety.

Outcome Measure

An unfavorable or potentially dangerous occurrence that takes place while a patient is in the care of a healthcare team is referred to as a patient safety event (also abbreviated as PSE for short). Although medical errors are defined as "an unplanned act (either of omission or commission) or one that does not accomplish its intended goal" (26), the vast majority of medical errors do not result in any kind of negative outcome for the patient. This study covers all aspects of patient safety, including but not limited to medication errors (such as incorrect dosage or timing of medication, wrong patient, wrong medication), falls that occur while patients are in the hospital, hospital-acquired infections, and hospital-acquired pressure ulcers, as well as a great number of other patient safety issues. It is essential to emphasize that even though a patient may fall, they will not sustain any injuries as a result of the fall. The patient's fall is still an issue with regard to patient safety in and of itself. Reports of incidents involving safety follow a protocol that is designed to fulfill the requirements of its intended use. Reporters can no longer maintain their anonymity if they use this method because it gathers information that can be used to identify them. The employees are expected and required to report everything through this system, but there is no way to actually enforce the regulation because there is no system in place to do so. The accompanying caveat states that not all incidents involving safety are documented due to the many different reasons that can be given for this. Between January 2018 and December 2019, there were incidents that occurred regarding patient safety. This time frame was decided upon in

Table 2. Zero-Order Correlations

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Patient safety culture attributes																		
1. Communication and feedback about error	1																	
2. Communication openness	0.62***	1																
3. Handoffs and transitions	0.35*	0.38*	1															
4. Nonpunitive response to error	0.26	0.63***	0.66***	1														
5. Frequency of events reported	0.66***	0.50***	0.25	0.34*	1													
6. Teamwork within units	0.55***	0.66***	0.57***	0.61***	0.44**	1												
7. Teamwork across units	0.35*	0.18	0.43**	0.22	0.29	0.46**	1											
8. Supervisor or manager expectations and actions promote patient safety	0.70***	0.66***	0.43**	0.57***	0.58***	0.53***	0.30	1										
9. Management	0.74**	0.58**	0.46*	0.47*	0.49**	0.48*	0.33*	0.82***	1									

support	*	*	*	*		*												
Unit and hospital characteristics																		
10. Safety grade	0.71***	0.78***	0.57***	0.62***	0.42**	0.77***	0.48**	0.75***	0.76***	1								
11. Tenure in unit	-0.25	-0.05	0.26	0.17	-0.19	-0.20	-0.15	0.04	0.09	-0.06	1							
12. Hospital	0.06	-0.07	-0.35	-0.32*	0.06	-0.06	-0.22	-0.18	-0.06	-0.22	-0.17	1						
13. Unit type	0.23	0.08	-0.28	0.03	0.34*	0.03	-0.17	0.25	0.19	0.05	-0.37*	0.35*	1					
14. Teaching hospital	0.04	-0.04	-0.05	-0.09	-0.11	0.06	-0.01	-0.07	0.09	-0.05	0.05	0.80***	0.20	1				
15. Hospital size	0.08	0.03	-0.28	-0.22	-0.02	0.03	-0.15	-0.15	0.03	-0.10	-0.15	0.95***	0.31	0.88***	1			
Outcome, safety event variables																		
16. Total safety event 2018-2019	-0.03	-0.24	-0.47**	-0.49**	-0.04	-0.21	-0.31	-0.20	-0.11	-0.328*	-0.21	0.32	0.10	0.20	0.30	1		
17. Total patient days 2018-2019	0.14	-0.18	-0.47**	-0.45**	0.16	-0.18	-0.30	-0.14	0.05	-0.25	-0.32*	0.50**	0.42**	0.26	0.45**	0.80***	1	
18. Safety events per 1,000 patient-days	-0.23	-0.16	-0.08	-0.14	-0.24	-0.10	0.01	-0.08	-0.21	-0.13	0.19	-0.27	-0.50**	-0.14	-0.27	0.45**	-0.11	1
Note. * p<0.05, **p<0.01, ***p<0.001																		

Table 3: Descriptive Statistics

Variable	**Mean**	**Std. Dev.**	**Min.**	**Max.**
Patient safety culture attributes				
Communication and feedback about error	3.96	0.23	3.54	4.48
Communication openness	3.66	0.23	3.19	4.21
Handoffs and transitions	3.36	0.25	2.79	3.86
Nonpunitive response to error	3.22	0.28	2.59	3.98
Frequency of events reported	3.94	0.18	3.56	4.22
Teamwork within units	3.93	0.36	2.80	4.43
Teamwork across units	3.37	0.11	3.17	3.68
Supervisor or manager expectations and actions promote patient safety	3.85	0.29	3.13	4.28
Management support	3.69	0.30	2.97	4.24
Unit characteristics				
Safety grade	3.86	0.36	3.00	4.47
Tenure in unit	2.35	0.45	1.62	3.67
Outcome, safety event variables				
Total safety event 2018-2019	300.87	169.65	21	724
Total patient days 2018-2019	12728.51	6231.52	1626	27571
Safety events per 1,000 patient-days	24.09	8.91	10.07	56.18

To begin, we examined the data and came to the conclusion that the negative binomial regression model provided the best fit. After that, we ran nine regressions with the number of patient days serving as the exposure and the total number of adverse events serving as the dependent variable. The number of days that an organization provides inpatient care to patients is measured in terms of patient days. For instance, two units that have the same number of total patient days may have different total patient cared for because one unit may have more patients passing through because of a short hospital stay, while the other unit may have less patients passing through because of a long hospital stay. This difference in total patients cared for may account for the equality in total patient days. Both units provide the same level of care to their patients, measured by the number of patient days. Patient days were included as an exposure variable (i.e., a type of control variable) because the volume of patients or beds per unit varies, implying that units vary in the "chance" for safety events to occur. This is why patient days were included as an exposure variable. Each regression model contained the primary predictor variable (HSOPS) as one of the independent variables, in addition to seven covariates (average safety grade of unit, average tenure in work unit, hospital, patient care unit type, teaching status of hospital, hospital size, and variance of the primary predictor variable). In order to get rid of the problem of multicollinearity, separate models were developed to test each hypothesis on its own. Because of the strong correlations that exist between the HSOPS variables, incorporating a large number of independent variables into a single regression model would produce unreliable beta coefficients. (27). The outcomes of the negative binomial regression models are presented in Table 4.

Table 4. Negative Binomial Regression Analysis Results

Total safety events with an exposure variable of patient days	β	SE	z	LR Chi2(8)	Prob > Chi2	Pseudo R2
Communication and feedback about error	-0.16	0.34	-0.49	18.57	0.017	0.04
Communication openness	0.03	0.34	0.09	16.87	0.032	0.04
Handoffs and transitions	-0.81	0.30	-2.73**	25.1	0.002	0.06
Nonpunitive response to error	-0.36	0.24	-1.49	19.13	0.014	0.04
Frequency of events reported	-0.39	0.36	-1.07	20.16	0.010	0.04
Teamwork within units	-0.05	0.22	-0.24	17.41	0.026	0.04
Teamwork across units	-0.61	0.62	-0.99	17.93	0.022	0.04
Supervisor or manager expectations and actions promote patient safety	0.38	0.31	1.21	18.77	0.016	0.04
Management support	-0.20	0.26	-0.74	18.17	0.020	0.04

In spite of the fact that each model was significant overall (Prob > Chi2 at p0.001), the independent variable of interest did not show significance in eight of the nine models. The only model that produced a significant direction prediction was the one that took into account handoffs as a predictor variable. As the average handoff reaction gets faster, Figure 1 and Table 3 show the projected increase in the number of safety incidents that will take place. The downward slope in Figure 1 demonstrates that there is a correlation between the average reaction to safety culture for handoffs and the reduction in the number of safety events that occur over the course of a year. According to Table 3.1, the expected number of safety events drops by 125 (378.5-252.9), which is equivalent to approximately 5 events occurring each month. This occurs when the average response time for handoffs increases from 3 to 3.5.

DISCUSSION

It was hypothesized that there would be a number of unfavorable connections between the characteristics of the HSOPS survey and the frequency of safety occurrences. We hypothesized, using Schein's Model of Organizational Culture as a guide, that factors of patient safety culture representing espoused beliefs ought to predict negative correlations with actual occurrences of patient safety issues. That is to say, when in-patient care teams at a hospital believe in the components of a healthy safety culture, the hospital has a greater chance of observing fewer adverse events related to patient safety. The vast majority of our predictive factors could not be linked to any adverse events involving patient safety. The one and only exception to this rule were handoffs and transitions, which had a very strong and unfavorable connection with patient safety events. The findings are presented in the following section, organized by the components of communication and relationship-based safety culture.

Communication

In the previous section, we argued that the HSOPS variables formed the communication environment. This environment

includes communication and feedback regarding error, communication openness, handoffs and transitions, nonpunitive response to error, and the frequency with which team members say near misses are reported. A communication environment that is willing to discuss mistakes and receives high ratings on all of these indicators is described. We hypothesized that increased communication, which includes greater openness, comfort with discussing mistakes, the expectation that mistakes would not result in sanctions, and the notion that people report near-misses, would be correlated with a reduction in the number of safety incidents. We came to the conclusion that the only thing that had an effect on the occurrence of safety incidents was people's perceptions of how handoffs and transitions are managed. The number of safety incidents was cut down significantly thanks to the smooth handoffs and transitions that were implemented. Perceptions of smooth handoffs and transitions, such as not losing information during shift changes or effectively communicating information between units, were found to be associated with a decrease in the number of safety incidents that occurred over time (an average margin of 128 events over 24 months, or 5.3 events/month). This represents a significant reduction in patient safety occurrences and suggests that how clinical team members perceive handoffs and transitions between clinical teams is essential in minimizing patient safety events. [Cause and effect] Similarly, study (28) found that adhering to the right processes during handoffs and transitions resulted in fewer communication breakdowns and higher levels of resilience. Handoffs and transitions have to go off without a hitch, and the importance of recognizing the value of these crucial moments in patient care is of the utmost importance. Handoffs and transitions are not the same as the other communication-related factors because they involve a specific behavior, whereas the other communication-related factors are focused on having dialogues about mistakes. It is possible that we need to take one step further to determine whether or not the dialogues are leading to changes in behavior, such as improvements in process, which ultimately contribute to a reduction in the number of safety events. However, the scores on the communication elements are relatively high, indicating that there is a fertile communication environment in which corrective measures can occur. This may give the impression that communication is less important than it actually is. This finding is in line with findings from earlier studies that demonstrated a correlation between an open communication environment and individuals' willingness to speak their minds about ways in which the organization can be improved (11,12). If the level of comfort with talking about mistakes and receiving criticism on those mistakes was not as high as it appears to be in this culture, the stages leading up to corrective action would be significantly more difficult. To put it another way, a pleasant communication environment is necessary but not sufficient for reducing the number of safety occurrences; the former is required, while the latter is sufficient. The question that needs to be answered by further research is whether or not the corrective actions that result from mistake communication actually reduce the number of safety incidents as anticipated.

Relationships

There are a couple of potential reasons why these variables did not have any effect on the occurrence of safety events. Teamwork within units refers to the degree to which members of the same clinical unit are able to support one another, whereas teamwork across units examines the degree to which teams comprised of clinicians working in different clinical units are able to work together effectively. The absence of a correlation in both examples may imply that, despite the fact that collaboration within and across units reflects favorably on such relationships, neither example implies that measures were taken to increase safety as a result of those ties. This could be the case even though collaboration reflects favorable impressions of such relationships. It is possible that behaviors directly influence safety occurrences as opposed to perceptions of the relationship being the factor that directly influences safety occurrences. It has been shown in previous studies (20) that nurses are supportive of their team members reporting safety occurrences; however, it is unknown whether this support leads to a reduction in the number of safety events. Perceptions of managers' expectations and actions encouraging patient safety, which are related to how much staff believed their superiors supported safety, had no effect on safety events. To legitimate safety's priority in the organization's culture, those in leadership roles should openly state their expectations of safety culture, but it is not yet known how those expectations link to the incidence of safety occurrences. Although managers were scored highly in our data for building a patient safety culture, providing support may not suggest that steps are being made to directly alter safety events (29). A group of nurse managers and their staff were studied, and it was discovered that managers who committed to promoting safety culture were major predictors of building a patient safety culture. This is consistent with the results of our research, which show that management support increases safety consciousness while having no effect on safety events. Management support for patient safety is related to hospital administration's apparent attitude toward safety and safety occurrences; yet, it has no influence on safety events. Although we expected to see an effect, some research implies that it did not exist (30). The findings revealed that indirect relationships between management support for safety and nurses' perceptions of safety were stronger than direct connections. They emphasized that speaking about safety is beneficial to safety culture when management and workers engage. Thus, management support is a necessary variable for patient safety, but appears to be an intervening variable in safety occurrences.

THEORETICAL IMPLICATIONS

In terms of Schein's paradigm, we notice a consistent relationship between artifacts (like the administration of HSOPS) and the proclaimed values of members of the in-patient clinical team. The high scores on both communication-related and relational factors indicate that the inpatient clinical teams are concerned about safety as well. That instance, the HSOPS, indicates that this hospital system is worried about patient safety, and those high scores also indicate that the inpatient clinical teams are worried about patient safety.

In addition, the characteristics of the relationships indicate that clinical teams place a high value on safety at multiple levels of the hospital system (within teams, by supervisors/managers, and by upper management). The cultural landscape seems to paint a clear picture. Implications for Everyday Life

The most readily apparent implication this research has for practice is that all members of staff should value handoffs and transitions. Effective handoffs and transitions can take many forms, including verbal communication, written communication, and the transfer of professional responsibility, among other forms. When people have the mindset that handoffs and transitions are highly valued, there is a corresponding reduction in the number of safety incidents that take place. It is imperative that hospitals keep looking into methods that will enable them to directly recognize and implement behaviors that reduce the number of safety incidents, and they must do so without stopping. Patient satisfaction and documented instances of safety incidents are two additional areas in which the safety standards of clinical teams could stand to improve.

The scores indicated that there was a high number of communication messages that supported and promoted safety culture, despite the fact that this study did not find any correlation between safety culture and safety occurrences. The behaviors that emerge from a positive communication environment and relationships and have a direct impact on patient safety occurrences could be easier to identify if hospitals examined the relationship between culture and specific behaviors emerging from the safety culture. This could help hospitals find the missing link. Additionally, hospitals might want to investigate the connection between PSIs and actual safety incidents that were reported by staff members. The disparity between these two may help to explain why there is no obvious correlation between factors of safety culture and actual safety occurrences. Once the reasons why reporting does not correspond to PSIs have been identified, it will be possible to devise a communication solution that will lead to enhanced and more precise reporting of safety events.

LIMITATIONS

One limitation that should be brought to your attention is the fact that the HSOPS is offered on a volunteer basis to employees once every 1.5 to 2 years. There is a good chance that there is a selection bias at play here; individuals who complete the survey may be more concerned about safety, and as a result, believe that the safety culture is stronger than it actually is. Those individuals who did not complete this iteration of the HSOPS were still involved in patient care; consequently, the relationship with patient safety events could be influenced not just by those individuals who did complete the survey, but also by those individuals who did not. On the other hand, given that this particular round of the HSOPS survey received a response rate of 73% overall, it is questionable whether or not this kind of bias consistently influences the findings.

FUTURE DIRECTIONS

The purpose of this research was to better understand how patient safety perceptions can be used to predict the frequency of safety events by employing Schein's Model of Organizational Culture as a framework for the investigation. The ideas behind the model were put to the test by using data collected from different subcultures within a large healthcare organization as well as nine variables taken from the HSOPS survey. It was discovered that handoffs and transitions were a significant predictor of a decrease in the number of safety incidents, whereas the other eight predictors were not. This demonstrates how crucial it is for clinical teams to communicate with one another about patient handoffs and transitions in order to maximize patient safety.

In subsequent research, it should be investigated how each of the HSOPS characteristics could possibly be linked to action-based behaviors or other potential intervening mediators, and how these, in turn, could be related to health outcomes. By examining more direct links between HSOPS characteristics and behaviors of hospital staff that affect health outcomes, such as reduced safety occurrences, we can gain a better understanding of which aspects of patient safety culture are the critical levers to effect outcomes. This will allow us to gain a better understanding of what parts of patient safety culture are the critical levers to effect outcomes.

It is also a possibility that inpatient clinical teams are significantly different from other patient safety subcultures that have the potential to be researched. Future research should investigate not only these but also other hospital subcultures in order to determine whether or not there is a correlation between safety culture and outcomes, such as patient safety indicators (PSIs) and reported safety events. It is important for future research to concentrate on the ways in which communication and relationships influence perspectives on safety culture as well as reporting practices in different hospital units.

CONCLUSION

The purpose of this research was to investigate the relationship between the perceptions of patient safety culture and the number of safety incidents that occur in hospitals. The organizational culture model developed by Schein is applied here as a conceptual framework for the purpose of predicting connections between patient safety culture and actual patient safety incidents. According to the findings, the activity of handoffs and transitions was a significant factor in predicting the occurrence of safety incidents. More research needs to be done to investigate the ways in which messages passed between members of a unit can have an effect on the overall safety culture of an organization.

REFERENCES

I. Neville, B., Miltner, R. S., & Shirey, M. R.. Clinical Team Training and a Structured Handoff Tool to Improve Teamwork, Communication, and Patient Safety. JHQ 2021; 43(6), 365-373.
II. James, J. T. A new, evidence-based estimate of patient harms associated with hospital care. JPS 2013; 9(3), 122-128.
III. Schein, E. H. Organizational culture. American Psychologist. 1990; 45(2), 109–119.
IV. Singer, S. J., Gaba, D. M., Falwell, A., Lin, S., Hayes, J., & Baker, L. Patient safety climate in 92
V. U.S. hospitals: Differences by work area and discipline. Medical Care. 2009; 47(1), 23-31.
VI. Schein, E. H. Organizational culture and leadership. 2010 (4th Ed.) Jossey-Bass
VII. Banka, et al. Improving patient satisfaction through physician education, feedback, and incentives. JHM 2015; 10(8), 497-502.
VIII. Goffman, E. On face-work: An analysis of ritual elements of social interaction. PJSIP 1955; 18(3), 213–231.
IX. Kaldjian, L. C., Jones, E. W., Wu, B. J., Forman-Hoffman, V. L., Levi, B. H., & Rosenthal, G. E. Reporting medical errors to improve patient safety: A survey of physicians in teaching hospitals. AIM 2008; 168(1), 40-46.
X. Pham, et al. National study on the frequency, types, causes, and consequences of voluntarily reported emergency department medication errors. JEM, 40(5), 485-492.
XI. Lewin, S., & Reeves, S. Enacting 'team' and 'teamwork': Using Goffman's theory of impression management to illuminate interprofessional practice on hospital wards. SSM 2011; 72, 1595-1602.
XII. Detert, J. R., & Burris, E. R. Leadership behavior and employee voice: Is the door really open? AMJ 2007; 50, 869-884.
XIII. Kassing, J. W. Investigating the relationship between superior-subordinate relationship quality and employee dissent. Communication Research Reports. 2000; 17(4), 387-396.
XIV. Garner, J. T. Open doors and iron cages: Supervisors' responses to employee dissent. IJBC 2016; 53(1), 27-54.
XV. Johnson, A., Guirguis, E., & Grace, Y. Preventing medication errors in transitions of care: A patient case approach. JAPA 2015; 55(2),e264-e276.
XVI. American Pharmacists Association, & American Society of Health-System Pharmacists. Improving care transitions: optimizing medication reconciliation. JAPA 2012; 52(4), e43-e52.
XVII. Tjosvold, D., Yu, Z. Y., & Hui, C. Team learning from mistakes: The contribution of cooperative goals and problem-solving. JMS 2004; 41(7), 1223-1245.
XVIII. Evans, et al. Attitudes and barriers to incident reporting: A collaborative hospital study. BMJ Quality & Safety. 2006; 15(1), 39-43.
XIX. Steen, S., Jaeger, C., Price, L., & Griffen, D. Increasing patient safety event reporting in an emergency medicine residency. BMJ Open Quality. 2017; 6(1), 1-5.
XX. Dunbar, et al. An improvement approach to integrate teaching teams in the reporting of safety events. Pediatrics. 2017; 139(2), 1-10.
XXI. Ammouri, A. A., Tailakh, A. K., Muliira, J. K., Geethakrishnan, R., & Al Kindi, S. N. Patient safety culture among nurses. International Nursing Review. 2015; 62(1), 102-110.
XXII. Lee, S. H., Phan, P. H., Dorman, T., Weaver, S. J.,& Pronovost, P. J. Handoffs, safety culture, and practices: Evidence from the hospital survey on patient safety culture. BMC Health Services Research. 2016; 16(1), 1-8.
XXIII. Cho, S. M., & Choi, J. Patient safety culture associated with patient safety competencies among registered nurses. Journal of Nursing Scholarship. 2018; 50, 549-557.
XXIV. Fan, et al. Association of safety culture with surgical site infection outcomes. JACS 2016; 222(2). 122-128.
XXV. Alenezi, et al. Clinical practitioners' perception of the dimensions of patient safety culture in a government hospital: A one-sample correlational survey. JCN 2019; 28(23-24), 4496-4503.
XXVI. Blegen, M. A., Gearhart, S., O'Brien, R., Sehgal, N. L., & Alldredge, B. K. AHRQ's hospital survey on patient safety culture: Psychometric analyses. JPS 2009; 5(3):139-144.
XXVII. Leape, L. Error in medicine. JAMA. 1994; 272(23), 1851-1857
XXVIII. Mardon, R. E., Khanna, K., Sorra, J., Dyer, N., & Famolaro, T. Exploring relationships between hospital patient safety culture and adverse events. JPS 2010; 6, 226-232.

XXIX. Abraham, J., Kannampallil, T. G., Almoosa, K. F., Patel, B., & Patel, V. L. Comparative evaluationof the content and structure of communication using two handoff tools: Implications for patient safety. Journal of Critical Care 2014; 29(2), 311.e1-311.e7.

XXX. Feng, X. Q., Acord, L., Cheng, Y. J., Zeng, J. H., & Song, J. P. The relationship between management safety commitment and patient safety culture. INR 2011; 58(2), 249-254.

XXXI. Auer, C., Schwendimann, R., Koch, R., De Geest, S., & Ausserhofer, D. How hospital leaders contribute to patient safety through the development of trust. JNA 2014; 44(1), 23-29.