THE ROLE OF LEADERSHIP IN LEARNING CULTURE AND PATIENT SAFETY

Yong-Mi Kim and Donna Newby-Bennett*

ABSTRACT. Patient safety improvement through management has been a prime issue since 2000, when the Institute of Medicine reported that preventable mismanagement was responsible for the majority of medical errors. Learning culture, interdisciplinary action teams, and punitive culture have been discussed as viable ways to address these errors. While these individual factors have been found to be significant, we have yet to understand the interactions of these elements. The role of leadership, which has been overlooked, is critical to facilitate or constrain these elements. The interactions of these three elements and the role of leadership were analyzed using structural equation modeling. Our finding revealed the three elements were closely knitted, and leadership roles had considerable impact in nurturing learning culture and constraining punitive culture, which in turn enhanced patient safety.

INTRODUCTION

Patient safety improvement from a managerial perspective has received considerable attention since 2000, when the Institute of Medicine (IOM) reported that the majority of medical errors were responsible for the mismanagement of patient care. The IOM noted that 44,000 Americans die each year as a result of medical errors, making medical error the eighth leading cause of death in the U.S.

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Had there been sound patient safety managements in place, those errors could have been prevented (IOM, 2000). This research serves as a watershed event in managerial approaches for patient safety improvement. Hospital managers were surprised by the finding that medical errors were not attributed to technical issues, but patient safety mismanagement. This finding has prompted scholars to discover sustainable managerial efforts that can prevent errors.

Scholars have predominantly approached the management of patient safety from a cultural perspective (e.g., Singer et al., 2009; Hellings, Schrooten, Klazinga, & Vleugels, 2007; Johnson, 2004; Katz-Navon et al., 2005; Aspden, Corrigan, Wolcott, & Erickson, 2004; IOM, 2000). This may be because culture helps explain organizational members’ behaviors based on organizational values and beliefs (Singer et al., 2009) and allows a systematic understanding of the underlying patterns of employees’ behaviors. Culture is defined as the underlying reasons and mechanisms for why certain behaviors occur in an organization based on fundamental assumptions, beliefs, and values (Ostrom, Kinicki, & Tamkins, 2003). Similarly, patient safety is defined as “an integrated pattern of individual and organizational behavior based upon shared beliefs and values that continuously seek to minimize patient harm that may occur from the process of care delivery” (Aspden, Corrigan, Wolcott, & Erickson, 2004, p. 174). Culture explains why an objective such as safety is pursued in the manner exhibited within a particular organization (Singer et al., 2009), and it provides a context for employees’ sensemaking regarding their actions (Ravasi & Schultz, 2006).

Existing literature has identified three salient cultural elements that have direct relationships with medical errors: interdisciplinary action team (IAT), punitive culture, and learning culture (Tucker & Edmondson, 2003; Chuang, Ginsburg, & Berta, 2007; Khatri, Brown, & Hicks, 2009; Hellings, Schrooten, Klazinga, & Vleugels, 2007; Kalisch & Aebersold, 2006).

Interdisciplinary action team (IAT) has been extensively discussed because patient care is carried out via an interdisciplinary team (Singer et al., 2009; Rafferty, Ball, & Aiken, 2010), and IAT has been recognized as the basis for forming hospital culture (e.g., Dougherty, 1992). IAT is the culture for knowledge exchange atmospheres among diverse team members that require coordination and
collaboration in order to perform a task within intense and unpredictable situations (Sundstrom, de Meuse, & Futrell, 1990; Edmondson, 2003). Poor IAT is partially blamed for a punitive culture (Khatri, Brown, & Hicks, 2009; Hellings, Schrooten, Klazinga, & Vleugels, 2007). A punitive culture is referred to as a set of norms within an organization, characterized by an unwillingness to take responsibility because of blaming or being punished for mistakes (Khatri, Brown, & Hicks, 2009). This culture has been recognized as pervasive in hospitals and has been labeled a root cause of medical errors (Chuang, Ginsburg, & Berta, 2007; Kalisch & Aebersold, 2006). Recognizing the problems of punitive culture, learning culture has recently been introduced in order to improve problems within the culture. Learning culture is defined as “an atmosphere of mutual trust in which all staff members can talk freely about safety problems and how to solve them, without fear of blame or punishment” (Institute for Healthcare Improvement, 2005). Learning and punitive cultures are two sides of one coin in the hospital culture and must be collectively addressed. More specifically, learning culture cannot thrive without first addressing punitive culture because information about errors, which are the basis for organizational learning, cannot be effectively collected in a punitive culture. In a punitive culture, employees are compelled to hide their mistakes for fear of punishment (Tucker & Edmondson, 2003; Chuang, Ginsburg, & Berta, 2007). Consequently, punitive culture directly poses a threat to collecting information and nurturing a learning culture (Khatri, Brown, & Hicks, 2009; Hellings, Schrooten, Klazinga, & Vleugels, 2007; Chuang, Ginsburg, & Berta, 2007; Kalisch & Aebersold, 2006). Learning culture is closely related to IAT because hospitals function as teams, and individuals’ learning occurs within teams (Edmondson, 1999; Edmondson, Bohmer, & Pisano, 2001). Learning culture is especially important for IAT because individuals cannot effectively collaborate with each other if they don’t know the roles of other members (e.g., Friesen, White, & Byers, 2008). As a consequence, these three elements are closely intertwined and collectively impact patient safety (IOM, 2000; Department of Health, 2000; Khatri, Brown, & Hicks, 2009; Hellings, Schrooten, Klazinga, & Vleurgels, 2007; Tucker & Edmondson, 2003; Frankel, Leonard, Simmonds, & Haraden, 2009). Nonetheless, these elements have previously been analyzed as independent entities rather than closely-knitted cultural
elements. Conversely, this study analyzes these three elements holistically.

To advance the understanding of patient safety improvement, the role of leadership must be included. Leadership is instrumental in cultivating and nurturing the elements necessary for patient safety (Chuang, Ginsburg, & Berta, 2007; Edmondson, Bohmer, & Pisano, 2001). Other disciplines, such as management, have actively investigated the role of leadership and reported positive relationships with organizational performance (Vera & Crossan, 2004; Orlikowski, Yates, Okamura, & Fujimoto, 1995). A leader can signal the importance of certain behaviors, such as learning and punitive behaviors (Vera & Crossan, 2004), as well as reward and encourage desirable actions (Orlikowski, Yates, Okamura, & Fujimoto, 1995; Boynton & Zmud, 1987). The role of leadership is critical in hospitals, where hierarchical culture is intense, and a leader can ease punitive culture and nurture a learning culture. Despite the critical role of leadership, it has not been systematically considered in the health care industry context. Recognizing that leaders have the potential to further enhance patient safety, this paper attempts to answer the following research questions: first, to what extent previously identified constructs (i.e., IAT, punitive culture, and learning culture) are intertwined to impact patient safety; second, to what extent does a leadership role impact patient safety; third, to what extent does leadership facilitate/constrain the constructs (i.e., learning and interdisciplinary action team, and punitive culture)? By answering these questions, we seek to contribute to the field by enhancing the understanding of the inter-correlation of the patient safety-related constructs, and the importance of leadership in patient safety.

The next section presents a literature review focused on how leadership is intertwined with other constructs (i.e., IAT, learning culture, and punitive culture), and how it impacts patient safety. Detailed research methods are offered in the third section, and research findings and discussions are provided in the fourth section. This paper concludes with the managerial implications and limitations of this study.
LITERATURE REVIEW

Literature Review and Hypothesis Development

This section includes the proposed research model and hypothesis development derived from existing literature, and discusses how safety cultures are related to patient safety and intertwined with each other. Figure 1 is a graphic presentation of the conceptual model of this study and the relationships among constructs, which are based on existing literature. The role of leadership is hypothesized to impact the three constructs. In a highly hierarchical culture, the leader can create environments where employees feel safe, and thus it is logical to believe that the role of leader is expected to impact employees’ behaviors.

FIGURE 1
Proposed Research Model

Interdisciplinary Action Team

As noted earlier, the interdisciplinary action team (IAT) is a culture wherein team members feel comfortable exchanging information and taking actions needed for team coordination in intense and unpredictable situations (Sundstrom, de Meuse, & Futrell, 1990; Edmondson, 2003). While this definition includes team collaboration,
it recognizes team members’ diverse backgrounds and unpredictable situations, which are suitable for hospital activities because hospital teams need to respond to unanticipated events in a coordinated way (e.g., emergency patients) and reciprocal coordination of actions among members is required. Coordination has been a main dilemma within hospitals as the uniqueness of each team member, e.g., distinctively different expertise, skills, backgrounds, status, training, languages, and norms (Dougherty, 1992), contributes to communication breakdowns. In fact, communication breakdown among team members is a leading cause of medical errors (e.g., IOM, 2000; Veltman & Larison, 2007; Leonard, Frankel, & Simmonds, 2009; Reader, Flin, Mearns, & Cuthbertson, 2007).

Recognizing the importance of collaboration and coordination, employees in hospitals give the highest scores possible to the importance of team collaboration in enhancing patient safety (Hellings, Schrooten, Klazinga, & Vleugels, 2007). Higher levels of perceived teamwork among nurses are related to higher levels of quality improvements and confidence in patient safety (Rafferty, Ball, & Aiken, 2010), and strong IAT has been found to have positive relationships with patient safety (Singer et al., 2009; Rafferty, Ball, & Aiken, 2010). Conversely, poor collaboration leads to an increased number of patient errors (Kalisch & Aebersold, 2006) and is attributed to 40% of maternal deaths and 45% of near-miss morbidities (Geller, Rosenberg, & Cox, 2004). Additionally, poor IAT coordination at various levels of the organization appears to affect the quality and safety of patient care (Young et al., 1998). Based on these reports, it is not surprising that team collaboration is found to be a focal element to patient safety (e.g., Manser, 2009). Therefore, one can posit H1 as follows:

**H1:** Positive interdisciplinary action team will positively relate to patient safety.

**Learning Culture**

As noted earlier, learning culture is an environment wherein employees feel safe to share issues and problems without fear of punishment (Institute for Healthcare Improvement, 2005). Because organizational learning originates from a willingness to improve by sharing experiences, including mistakes, a culture that encourages employees to speak up freely and/or report errors with little fear
serves as the basis for a successful learning culture (Schutz, Counte, & Meurer, 2007). This culture has been discussed relatively recently in the field as patient safety problems are blamed for the lack of systematic analysis of error-related information. For example, although learning culture is central to patient safety, it is surprising that only 10% of errors are used for learning while 90% are not effectively used for patient safety improvement (Tucker & Edmondson, 2003). It is also reported that 50% of adverse events could have been prevented if there had been a learning mechanism in place (Chuang, Ginsburg, & Berta, 2007). Due to the lack of a learning culture, hospitals miss opportunities to correct faulty systems that have been the root cause for the majority of recurring errors (e.g., Frankel, Leonard, Simmonds, & Haraden, 2009; Reason, 2000; Department of Health, 2000; IOM, 2000; Tucker & Edmondson, 2003).

Learning culture is expected to enhance IAT because team collaboration requires an understanding of the roles of other team members in order to perform tasks in a coordinated manner. In a learning culture, employees are encouraged to freely ask questions and share information about their roles (Schutz, Counte, & Meurer, 2007), which allows team members to have a better understanding of other team members’ roles and responsibilities. Empirical studies have found that when team leaders meet and discuss ways to improve collaboration, the effort enhances understanding of the roles of others (Horak, Guarino, Knight, & Kweder, 1991), and therefore hypotheses are proposed as follows:

H2: Higher levels of learning culture will positively relate to patient safety.

H3: Higher levels of learning culture will positively relate to interdisciplinary action team.

Punitive Culture

A punitive culture is a organizational norm that punishes or reprimands employees’ mistakes or errors rather than discovering underlying causes of problems and preventing unwanted incidents from happening; subsequently, in this culture, staff members are afraid of being caught making mistakes and are therefore hesitant to report problems or potential dangers, even if such reports can prevent accidents from happening (Khatri, Brown, & Hicks, 2009).
Furthermore, due to fear of punishment, employees feel safer being silent instead of revealing problems or asking questions (Khatri, Brown, & Hicks, 2009; Hellings, Schrooten, Klazinga, & Vleugels, 2007). Existing research reports that punitive cultures are pervasive in hospitals (Chuang, Ginsburg, & Berta, 2007; Kalisch & Aebersold, 2006) because health care organizations traditionally strive for mistake-free employee performance and blame those who deviate from perfection (Nieva & Sorra, 2003). As a result, employees tend to undertake unnecessary paperwork in order to protect themselves while avoiding penalties and punishments. This action diverts their attention from patient safety and displaces the priority of patient care (Khatri, Brown, & Hicks, 2009). In a punitive culture, employees attempt to avoid reprimands at the expense of improving patient safety; therefore, a punitive culture poses serious threats to patient safety.

A punitive culture bears other serious threats to a learning culture. More specifically, organizational learning is possible when an organization collects information about problems and analyzes them systematically; however, a punitive culture considerably undermines this as employees do not actively report accidents or errors, and therefore evidence-based learning is limited (Department of Health, 2000; Silen-Lipponen, Tossavainen, Turunen, & Smith, 2005; Hellings, Schrooten, Klazinga, & Vleugels, 2007). Furthermore, because employees’ mistakes and errors could be detailed in their personal files, which in turn could impact their evaluations, employees are compelled to hide information that may negatively impact their performance. Therefore, it is logical to argue that unless hospitals address punitive culture first, a learning culture may not successfully thrive, and therefore the success of a learning culture is contingent upon the strength of a punitive culture.

A punitive culture is also detrimental to IAT. In a punitive culture, employees feel safer remaining silent even if they notice problems or errors that can be prevented (Khatri, Brown, & Hicks, 2009; Hellings, Schrooten, Klazinga, & Vleugels, 2007); therefore, IAT is compromised. Employees may not voluntarily help other members in an effort to minimize involvement in teamwork due to fear of possible accidents. Owing to the lack of communication in this culture, team members may not fully understand the roles of their team members and, as a result, may not be able to effectively collaborate. Altogether,
punitive culture negatively affects the IAT. Based on this discussion, H4, H5, H6 are proposed as follows:

H4: Punitive culture will negatively relate to patient safety.

H5: Punitive culture will negatively relate to learning culture.

H6: Punitive culture will negatively relate to interdisciplinary action team.

Leadership

In this paper, a leader is defined as the person who is in a position to evaluate employees’ performance, which may describe a manager or supervisor. This definition is appropriate for this study because a team in a hospital goes through continuous forming and disbanding processes, and while the team may not have a formal manager, a senior doctor in charge of a surgery may serve as a leader or supervisor (Edmondson, Bohmer, & Pisano, 2001). As a consequence, for this paper a leader includes whoever (e.g., manager or supervisor) has the power to evaluate the group members. The role of leadership is believed to be important in hospitals because of the strong hierarchical culture that poses obstacles for junior doctors or nurses to communicate with senior doctors or managers (Reader, Flin, Mearns, & Cuthbertson, 2007), and a leader could ease such culture.

Research on leadership in the hospital context is sparse. Although various leadership styles are available, participatory leadership is appropriate as this leadership facilitates discussions, enables joint decision-making, and motivates members to participate, which in turn enhances the performance of the group (Baumgarel, 1957). As stated, considerable medical errors are attributed to the lack of team members’ participations, which requires a leader to encourage employees to offer their opinions and insights. As medical knowledge is advanced, respective fields develop their own specialized knowledge and skills, and patient care benefits; however, at the same time effective communication in IAT is more difficult due to specialized languages (Friesen, White, & Byers, 2008; Dougherty, 1992; Manser, 2009). Creating a non-punitive culture is an imperative for learning because employees are more likely to participate in the discussion (Institute of Medicine, 2000; McFadden et al., 2006; Leape, 1994; Uribe et al., 2002).
Good leadership is expected to enhance learning culture. An empirical study shows that good leadership increased reported errors (Edmondson, 2003). This does not mean that good leaders increased errors; instead, they created a non-threatening environment that prompted employees to speak openly about errors instead of hiding them. A leader who encourages employee participation is willing to learn about errors, detect the root causes of errors, and then improve the system rather than punish individuals (Edmondson, 2004). Therefore, it is clear that participatory leadership is likely to enhance learning culture while dissuading punitive culture.

Participatory leadership may also enhance IAT because the success of IAT is based on the active discussions about patient care. The lack of communication in IAT has long been recognized as a persistent problem area for patient safety (e.g., IOM, 2000). Studies show that hierarchical culture is blamed for the poor IAT. Specifically, junior doctors often reserved questions due to fears of appearing incompetent or being rejected, or embarrassed. Concurrently, senior doctors frequently complained that they did not receive accurate information from junior doctors or nurses (Edmondson 1999, 2003). Furthermore, nurses felt that they did not openly communicate with doctors, and trainee doctors did not perceive that they communicated freely with senior doctors in the intensive care unit (Reader, Flin, Mearns, & Cuthbertson, 2007). Leaders can create the environment for open communication and coordination (Flin & Yule, 2004; Reader, Flin, Mearns, & Cuthbertson, 2007) because they are in the position of seeing the complete picture and understanding how different sources of expertise fit together in projects (Wheelwright & Clark, 1995). Leaders can coach employees in providing clarification and feedback, seeking team members’ input, listening to concerns, and being accessible and receptive to the ideas and questions of others (Edmondson, 2003). A leader’s willingness to listen and relate suggestions about patient safety can signal to employees the importance of communication and can also enhance communication and coordination (Flin & Yule, 2004; Reader, Flin, Mearns, & Cuthbertson, 2007; Manser, 2009). Therefore, hypotheses are proposed as follows:

H7: Quality of leadership will positively relate to perceived patient safety.
H8: Quality of leadership will positively relate to learning culture.

H9: Quality of leadership will negatively relate to punitive culture.

H10: Quality of leadership will positively relate to interdisciplinary action team.

RESEARCH METHODOLOGY

The Agency for Healthcare Research and Quality has developed an instrument for the measurements of patient safety, and numerous scholars have used this instrument and reported on its usefulness (e.g., Bodur & Filiz, 2009; El-Jardali et al., 2010; Hellings, Schrooten, Klazinga, & Vleugels, 2007). Although existing studies have reported the explanatory power of individual constructs, the role of leadership and the interactions of each construct have not been considered. In order to add value to the field by investigating the role of leadership, this study used the existing instrument without modification. Because this study used previously validated items, the questionnaire’s items were not pre-tested or pilot tested as it is common practice to elect not to go through such practice if items were already validated (Kim, 2009). More specific discussions on construct operationalization, the treatment of common method variance (a major concern for psychometric research), the sampling, the treatment of missing variables, and confirmatory factor analysis will now be provided.

Construct Operationalization

Patient safety was defined as individual members’ shared values and beliefs about patient safety. As such, individual members who have direct contacts with patient are appropriate informants, and thus this study used individual members’ perceptions about patient safety (i.e., overall grade on patient safety). Because a leader is defined as whoever has the capability to evaluate group members’ behaviors, which could be a manager or a supervisor (e.g., senior doctor in the team), this study used manager or supervisor for a surrogate of leader in the questionnaire. Learning culture is measured by asking to what extent the team members know about a specific patient and can speak up about their concerns. The punitive culture is measured by to what extent respondents feel afraid about their mistakes and voicing their opinions. The interactive action team
is measured by to what extent team members collaborate. More specific item measurements are provided in Appendix 1.

The Sample

The finalized questionnaire was distributed to a metropolitan hospital located in the Midwest United States in 2008. The existing studies that use this instrument for different hospitals and countries show little differences across hospitals. As such, the finding of this study based on the metropolitan hospital can be applicable to other hospitals. The authors were not present at the data gathering site in order to enhance voluntary participation. The questionnaire was distributed to various units in this hospital because the purpose of this study was to investigate how leaders coordinate interdisciplinary team members and facilitate a learning culture.

The measurement of patient safety culture from the staff members’ perceptions is best suited for understanding hospital safety (Pinkerton, 2005). Following the recommendation, we surveyed hospital staff members who had contact with patients. The finalized questionnaire was distributed in 2008 in a metropolitan hospital located in the Midwest. A total of 317 questionnaires were distributed and 249 responses were collected (78.6% response rate), of which 220 were usable for analysis. Responses are representative of the various hospital units. About 50% of the staff members had worked in the hospital between 1 and 5 years, and 17% had worked in the hospital between 6 and 10 years, which means that respondents understand the culture and the systems and therefore serve as good informants for this research. More specific information about respondents is available in Appendices 2 and 3.

Treatment of Missing Variables

As noted, 220 out of 249 responses were usable. Missing variables for reflective measures were treated in a conservative way by substituting the mean of the variables within the same construct of the respondent. This treatment is more valid than other methods, such as the mean from all responses, because the same respondent is likely to answer items within the same construct similarly (Miranda & Kim, 2004). If a respondent answered less than half of a construct, the missing construct was treated as missing. Because formative
items are deemed to have a low reliability among items, missing variables are not treated for formative items.

**Confirmatory Factor Analysis**

Confirmatory factor analysis (CFA) allows researchers to test prespecified theoretical notions using structural equation modeling (SEM), and it rigorously tests convergent and discriminant validity (Diamantopoulos & Siguaw, 2006). Convergent validity is achieved when indicators are loaded according to the purported constructs and are significant. Discriminant validity is assessed by constraining the estimated correlation parameters (e.g., learning culture and punitive culture) to 1.0 and then performing a chi-square difference test on the values obtained for the constrained (i.e., set to 1) and unconstrained models (Kim, 2010). Discriminant validity is claimed to be achieved when the chi-square value between the constrained and unconstrained models is significantly different (Kim, 2010). The entire constructs in the proposed model demonstrated convergent validity for all constructs at p<.001 and achieved discriminant validity at p<.001.

Goodness of a model is assessed using various indices. The most commonly used indices are $\chi^2$, Normed $\chi^2$, Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA) (Hair et al., 2010). Insignificant values of $\chi^2$ value indicate a good fit between data in the analysis and the proposed theoretical model, prompting researchers to look for insignificant values. Its p-value is 0.000, which is significant. However, it is recommended to consider the value with Normed $\chi^2$ because $\chi^2$ is sensitive to the number of observations, while Normed $\chi^2$ is less sensitive to observations. Normed $\chi^2$ is a measure of a ratio of $\chi^2$ to the degrees of freedom (df) for a model. Generally, $\chi^2$: df ratios on the order 3:1 or less are associated with better-fitting models. Normed $\chi^2$ value is 1.901, which is considerably lower than the cutoff value. CFI is an improved version of the Normed Fit Index and is insensitive to model complexity; subsequently, it is the most widely used model index (Hair, Black, & Babin, 2010). Its cutoff value is 0.90. The CFI value is 0.923. RMSEA is another widely used model fit for how well a model suits the population. A lower value represents a better model fit, and the recommended cutoff value is between 0.03 and 0.08 (Hair, Black, & Babin, 2010). The value of RMSEA is 0.047, which is within the
proposed range of the cut-off value. Considering all these model fit indices, the fit of the proposed model is satisfactory.

Addressing Common Method Variance

Common method variance stems from the same method being used for multiple measurements (Campbell & Fiske, 1959). It is the greatest concern for psychometric research because it is the leading cause for false conclusions; when there is no relationship, researchers could falsely conclude that there is a genuine relationship. Therefore, research methodologists have strongly urged researchers to treat the problem before reporting any findings (Diamantopoulos & Siguaw, 2006; Jarvis, MacKenzie, & Podsakoff, 2003). Among the treatments, a mixture of reflective and formative measures is commonly used (e.g., Barki & Titah, 2007); therefore, that method was adopted for this paper.

The reflective measure is that a construct influences the items and, therefore, the items are claimed to be reflective of the construct. This measurement is commonly used for personality and/or attitude measures. For example, in the punitive culture, employees fear that their mistakes are held against them and kept in their files, and/or they are afraid to ask questions for fear of punishment. Because it is the punitive culture that makes employees feel in such ways, the items in the construct should have high common variance, inter-correlations, and internal consistency (Diamantopoulos & Siguaw, 2006; Barki & Titah, 2007), which is commonly measured as Cronbach’s $\alpha$, which has a cut-off value of 0.7 (Hair, Black, & Babin, 2010). Also, if employees feel comfortable asking questions or speaking up, it is the learning culture that allows this, which is referred to as reflective measure. Formative measures, on the other hand, represent that items of a construct are hypothesized to cause changes of the construct, and therefore, the direction of causality is from the items to the construct (Jarvis, MacKenzie, & Podsakoff, 2003). For example, if a leader constantly provides feedback to employees and informs employees about patient safety, and employees discuss ways to improve patient safety, these behaviors constitute a learning culture; not the other way around, which is referred to as formative measure. Because a leader or manager informing employees about patient safety and employees’ discussions about patient safety are distinctively different actions (these two behaviors are not necessarily correlated), reliability is not
commonly used as a validity measure; instead, nomonological validity and confirmatory factor analysis (CFA) (changes in validity) are used as a way to assess validity.

Identifying reflective and formative measures is very challenging because they are not always definitive (Diamantopoulos & Siguaw, 2006; Jarvis, MacKenzie, & Podsakoff, 2003). Consequently, scholars have proposed to use theoretical arguments (or nomonological validity) for the determination of formative measures (Jarvis, MacKenzie, & Podsakoff, 2003). Another method for the determination considers that because reliability estimates (e.g., Cronbach's alpha) among the formative items are assumed to be lower, the construct validity should not be significantly changed when a single indicator is removed (Diamantopoulos & Siguaw, 2006). The finalized items in Appendix 1 went through all these steps.

THE REPORT OF FINDINGS AND DISCUSSIONS

In order to facilitate discussion, the findings of the hypotheses are provided in Table 1. Notably, leadership was found to have
TABLE 1
Summary of Findings

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Finding</th>
</tr>
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<tbody>
<tr>
<td>H1: Positive interdisciplinary action team will positively relate to patient safety.</td>
<td>Not supported</td>
</tr>
<tr>
<td>H2: Higher levels of learning culture will positively relate to patient safety.</td>
<td>Supported</td>
</tr>
<tr>
<td>H3: Higher levels of learning culture will positively relate to interdisciplinary action team.</td>
<td>Supported</td>
</tr>
<tr>
<td>H4: Punitive culture will negatively relate to patient safety.</td>
<td>Not supported</td>
</tr>
<tr>
<td>H5: Punitive culture will negatively relate to learning culture.</td>
<td>Supported</td>
</tr>
<tr>
<td>H6: Punitive culture will negatively relate to interdisciplinary action team.</td>
<td>Not supported</td>
</tr>
<tr>
<td>H7: Quality of leadership will positively relate to perceived patient safety.</td>
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<tr>
<td>H8: Quality of leadership will positively relate to learning culture.</td>
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<td>Supported</td>
</tr>
<tr>
<td>H10: Quality of leadership will positively relate to interdisciplinary action team.</td>
<td>Supported</td>
</tr>
</tbody>
</table>

significant impacts on the constructs in Figure 2. More specifically, leadership facilitated a learning culture and IAT, and it dissuaded a punitive culture. The dataset showed that leadership had impacts on learning, punitive cultures, and patient safety. This may be because a leader who acknowledges good jobs and considers the suggestions of employees creates threatening environments for open communications about patient safety and about other patient-related issues, and therefore employees may feel safe discussing ways to improve patient safety with the leader. This dataset further found the positive relationship between leadership and IAT. Good leadership encourages employees to collaborate with other team members and enables employees to provide the best care for patients. This dataset showed that good leadership motivated employees to focus on patient care. It may be logical to conclude that in a highly hierarchical culture such as a hospital, the role of leadership could create an environment that allows employees to participate in discussions, enabling employees to feel psychologically safe while offering their insights. As such, group members are better aware of patient care and the roles of others, and that in turn enhances patient safety. The
findings were all highly significant, and therefore H7, H8, H9, and H10 are supported.

Next, a learning culture had a significant impact on patient safety and IAT (p<.001). It is consistent with the expectation that a learning culture would enhance IAT. It is interpreted that as a learning culture is cultivated, employees are more likely to share information and learn about the roles of other teams. As a consequence, they are able to cooperate and collaborate with each other. Therefore, H2 and H3 were supported in this dataset.

A punitive culture, on the other hand, posed serious threats to a learning culture. The finding further showed that although a punitive culture seriously undermined a learning culture, it did not directly impact patient safety and IAT. Therefore, H5 was supported while H4 and H6 were supported in this dataset. Again, this finding is not surprising based on the concepts of the two cultures being two sides of one coin. Researchers have consistently noted the problems of a punitive culture regarding patient safety and have called for a shift to a learning culture (e.g., Chuang, Ginsburg, & Berta, 2007), and yet little research has empirically investigated the relationship between the two cultures.

In summary, the finding showed the importance of the leadership role for patient safety. A leader is in the position to create and cultivate a learning culture while dissuading a punitive culture because hospital employees are afraid of supervisors or managers’ responses to their behaviors. As such, cultural changes in hospitals need to be initiated by whoever has the power to influence employees’ behaviors. In a hierarchical culture, employees tend to be receptive to a leader, and thus the role of leader is critical for cultivating desirable cultures. In this regard, this study contributes to existing studies by demonstrating the importance of leadership for patient safety. Additionally, because the three constructs are closely related, the managerial approach to patient safety needs to be holistic rather than a singular manner that addresses one by one.

CONCLUSIONS AND MANAGERIAL IMPLICATIONS

This study has examined the role of leadership in the patient safety context. Leadership has been reported as a most important element for organizational success, and yet there is a dearth of
research that has systematically explored this issue. This study serves as a modest step toward recognizing the importance of leadership for patient safety, and it also calls for further investigation. Because a hospital is composed of distinctively different experts, and therefore communication breakdown is a major problem, leaders need to encourage members to participate and facilitate environments where members can offer their expertise with little fear of consequences, which in turn enhances communication. This investigation is timely as the health care industry suffers from preventable errors that can be addressed through managerial efforts. Another contribution of this study is that existing studies had claimed that a leader could influence a punitive culture as well as a learning culture. This study empirically investigated the role of the leader in this context and showed the role of the leader in the patient care context. Lastly, although existing studies have demonstrated the explanatory power of the individual cultural aspects, little attention has been given to correlations among the constructs.

As for managerial implications, because leaders can influence employees’ behaviors, leaders (supervisory or managerial) are strongly recommended to actively invite employees to participate in discussions and to encourage employees to speak up. The role of leadership plays a key role in patient safety, and in order to cultivate advantageous cultures, leaders need to use a holistic approach because those sub-cultures closely impact each other.

This study has some limitations. The dependent variable is measured with one perceptual item. In any future studies, it is suggested to have more items. Also, it is recommended to have some objective data.

REFERENCES


### APPENDIX 1

#### Construct Operationalization

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Items</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived patient safety</td>
<td>Give your area/unit in this hospital an overall grade on patient safety (1 failing; 2 poor; 3 acceptable; 4 very good; 5 excellent)</td>
<td>NA</td>
</tr>
<tr>
<td>Leadership</td>
<td>My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures (formative)</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>My supervisor/manager seriously considers staff suggestions for improving patient safety (formative)</td>
<td></td>
</tr>
<tr>
<td>Learning culture (formative + reflective measures)</td>
<td>We are given feedback about changes put into place based on event reports (formative)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>We discuss ways to prevent errors from happening again (formative)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>We are informed about errors that happen in this unit (formative)</td>
<td>α = 0.73</td>
</tr>
<tr>
<td></td>
<td>Staff will freely speak up if they see something that may negatively affect patient care (reflective)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Staff feel free to question the decisions or actions of those with more authority (reflective)</td>
<td></td>
</tr>
<tr>
<td>Punitive culture (reflective measures)</td>
<td>Staff feel like their mistakes are held against them (reflective)</td>
<td>α = 0.78</td>
</tr>
<tr>
<td></td>
<td>Staff worry that mistakes they make are kept in their personal file (reflective)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Staff are afraid to ask questions when something does not seem right (reflective)</td>
<td></td>
</tr>
<tr>
<td>Interdisciplinary action team (formative measures)</td>
<td>When a lot of work needs to be done quickly, we work together as a team to get the work done (formative)</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>When one area in this unit gets really busy, others help out (formative)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>There is good cooperation among hospital units that need to work together (formative)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hospital units work well together to provide the best care for patients (formative)</td>
<td></td>
</tr>
</tbody>
</table>

Note: All items are taken from AHRQ.
### APPENDIX 2
**Respondents’ Work Units**

<table>
<thead>
<tr>
<th>Department/Unit Name</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Various Units*</td>
<td>65</td>
<td>26.10</td>
</tr>
<tr>
<td>Medicine</td>
<td>31</td>
<td>12.45</td>
</tr>
<tr>
<td>Intensive Care Unit</td>
<td>31</td>
<td>12.45</td>
</tr>
<tr>
<td>Radiology</td>
<td>26</td>
<td>10.44</td>
</tr>
<tr>
<td>Emergency Department</td>
<td>20</td>
<td>8.03</td>
</tr>
<tr>
<td>Laboratory</td>
<td>18</td>
<td>7.23</td>
</tr>
<tr>
<td>Surgery</td>
<td>17</td>
<td>6.83</td>
</tr>
<tr>
<td>Obstetrics</td>
<td>16</td>
<td>6.43</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>11</td>
<td>4.42</td>
</tr>
<tr>
<td>Rehabilitation Medicine</td>
<td>10</td>
<td>4.02</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>2</td>
<td>0.80</td>
</tr>
<tr>
<td>Anesthesiology</td>
<td>2</td>
<td>0.80</td>
</tr>
<tr>
<td>Total</td>
<td>249</td>
<td>100</td>
</tr>
</tbody>
</table>

Note: *Employees belong to more than one unit.

### APPENDIX 3
**Respondents’ Experience in the Hospital**

<table>
<thead>
<tr>
<th>Experience</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 year</td>
<td>21</td>
<td>8.50</td>
</tr>
<tr>
<td>1 to 5 years</td>
<td>119</td>
<td>48.18</td>
</tr>
<tr>
<td>6 to 10 years</td>
<td>41</td>
<td>16.60</td>
</tr>
<tr>
<td>11 to 15 years</td>
<td>16</td>
<td>6.48</td>
</tr>
<tr>
<td>16 to 20 years</td>
<td>14</td>
<td>5.67</td>
</tr>
<tr>
<td>21 years or more</td>
<td>36</td>
<td>14.57</td>
</tr>
<tr>
<td>Total</td>
<td>247</td>
<td>100</td>
</tr>
</tbody>
</table>