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Development of the Just Culture Assessment Tool (JCAT): Measuring the Perceptions of HealthCare Professionals in Hospitals

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Abstract

Objectives—Given the growing support for establishing a just patient safety culture in healthcare settings, a valid tool is needed to assess and improve just patient safety culture. The purpose of this study was to develop a measure of individual perceptions of just culture for a hospital setting.

Methods—The 27 item survey was administered to 998 members of a healthcare staff in a pediatric research hospital as part of the hospital's ongoing patient safety culture assessment process. Subscales included balancing a blame-free approach with accountability, feedback and communication, openness of communication, quality of the event reporting process, continuous improvement, and trust. The final sample of 404 participants (40% response rate) included nurses, physicians, pharmacists and other hospital staff members involved in patient care. Confirmatory factor analysis was used to test the internal structure of the measure and reliability analyses were conducted on the subscales.

Results—Moderate support for the factor structure was established with confirmatory factor analysis. After modifications were made to improve statistical fit, the final version of the measure included six subscales loading onto one higher-order dimension. Additionally, Cronbach's alpha reliability scores for the subscales were positive, with each dimension being above 0.7 with the exception of one.

Conclusions—The instrument designed and tested in this study demonstrated adequate structure and reliability. Given the uniqueness of the current sample, further verification of the JCAT is needed from hospitals that serve broader populations. A validated tool could also be used to evaluate the relation between just culture and patient safety outcomes.

Keywords

Just culture; patient safety; patient safety culture; healthcare professionals; Just Culture Assessment Tool (JCAT)

Introduction

The importance of a healthy culture for safety has been emphasized by researchers and leaders from a wide variety of industries.¹⁻⁴ Establishing a strong safety culture is a critical step in achieving what has been called “high reliability”. High reliability organizations are those that dependably function at safe levels while carrying great potential for human harm.^{5,6} Moreover, they are marked by their systematic approaches to process improvement.⁷ While safety culture research began as reactive (i.e., identifying cultural weakness as causes for major safety disasters), there is currently a wealth of resources available for organizations to foster strong cultures for safety in an effort to prevent harm and safety-related accidents.^{3,8-10} A strong safety culture values safety protocols, fosters learning from mistakes, in an effort to ultimately prevent injuries and save lives.^{3,9} Reason asserts that the most effective safety cultures are informed about best safety practices, able and willing to report safety related issues, staffed with employees who trust each other's commitment to best practices, flexible to adapt and alter best safety practices, and value safety related events as opportunities to learn from mistakes in order to make substantial system changes.³ As research in the area has spread, more value has been placed on establishing and maintaining an effective culture for safety.

Reactions to safety-related events or incidents has shifted from a focus on individuals and a “blame-retrain” punitive approach to mistakes to a more holistic, system-wide perspective on the protocols, policies, prior behaviors, etc. that may have contributed to the safety event in question.^{3,4,11} Responding to safety incidents in this manner not only leads to a more accurate picture of the event, in that it is rarely the case that one decision or individual can be solely responsible for the incident, but also fosters a stronger culture for safety by shifting culpability from the individual to the system. There are numerous benefits associated with moving away from a punitive approach to errors, yet a strictly non-punitive culture does not inherently carry the ability to consider that some errors do warrant individual accountability. Frequent errors by a single person, errors made under the influence of drugs or alcohol, or errors resulting from a direct disregard of safety protocols or procedures are instances that may justify punitive actions being taken to aid in their prevention. In response to the negative consequences associated with a strictly punitive or non-punitive approach to safety, there is growing support for embracing a *just culture* that strikes a balance between the two.^{12,13}

Originally defined by Reason as “a collective understanding of where the line should be drawn between blameless and blameworthy actions,” just culture first appeared in the aviation safety literature and has been gaining prominence in other “high hazard” industries like healthcare.^{3,14} In the context of medical error, patient safety culture first focused on a systems and non-punitive approach that recognized the complexity of health care and mitigated the tendency to blame individuals involved in medical error. Just culture deviates from a strictly non-punitive safety culture, in that its systems-approach to error is balanced with the potential for individual accountability. Several recent publications tout the benefits associated with just culture, such as increased reporting and decreased medical error, therein supporting efforts to integrate its ideals into contemporary organizations.¹⁵⁻¹⁷

In order to implement cultural change and achieve a strong and stable patient safety culture throughout an organization, it is first necessary to accurately assess the status quo. To date, there are multiple well-known instruments for measuring an organization's overall patient safety culture, yet a review of the literature did not reveal a valid and reliable tool that explicitly assesses just culture in hospitals and other healthcare settings.¹⁰ Just culture operates as a subset of safety culture, meaning that certain aspects of overall patient safety culture are less relevant (e.g., *staffing* and *handoffs and transitions*).⁸ Measuring the two concepts independently should provide a clearer picture of the organization's cultural state than measuring only one or the other, thus, greater assisting the improvement process. For example, perceptions of just culture are focused on reactions to specific adverse events; therefore, when working to improve just culture, it is helpful to have specific data on staff experiences. In contrast, well-known measures of patient safety culture (e.g., the Agency for Healthcare Research and Quality Hospital Survey for Patient Safety Culture) are efficient at producing a broad overview.⁸

The existing patient safety culture measurement instruments lack the ability to directly gauge concepts important to a just culture (i.e. perceptions of fairness and trust in the manner in which management and an organization react to adverse safety events).^{8,10} As more hospitals are increasingly putting forth the effort towards implementing a just culture for patient safety it is becoming important to effectively distinguish between overall patient safety culture, and a just culture for patient safety.^{16,17} The purpose of this study was to design and validate a tool that can be used to measure individual perceptions of a just culture in a hospital setting.

Methods

Participants

This study included patient care providers from a pediatric hospital. All healthcare providers were invited by email and other internal communication to participate. The sampling frame of individuals involved in patient care was 998 healthcare professionals, including nurses, physicians, pharmacists, etc. (see Table 1). Before deleting 38 cases (see Results for an explanation of the cases deleted), the initial sample included 404 individuals, yielding a response rate of approximately 40%. Demographic data included staff position (see Table 1) along with tenure in profession, specialty, and hospital (see Table 2).

Procedure

The institutional review board (IRB) of both the pediatric hospital and the university associated with the research reviewed the project and designated it as exempt. The survey was administered in on-line electronic format to the hospital staff in conjunction with the Agency for Healthcare Research and Quality (AHRQ) Hospital Survey on Patient Safety Culture that the hospital routinely administers approximately every two years. The AHRQ survey measures 12 dimensions of patient safety culture (e.g., *communication openness*, *teamwork within hospital units*, *hospital handoffs and transitions*).⁸ It is the most widely used measure of hospital patient safety culture, with more than 1100 hospitals in the US contributing data to a benchmark database maintained by AHRQ.¹⁸ This survey is announced well in advance and has historically had high response rates at the hospital. Potential participants were recruited using emails and electronic newsletters. Both formats explained the purpose of the survey, asked participants to complete the survey, and included instructions for accessing the survey. In order to encourage the best response rate possible, the participants received two emails from the hospital's Clinical Director and communication from their respective department heads (e.g. Chief Pharmaceutical Officer, Chief Nursing Officer). Although the study was granted IRB exemption, a "yes or no" question was used to obtain consent from participants and verify that they understood the nature of the study and its volunteer basis. Participants were informed that their results would be anonymous and no attempt would be made to link the responses to an individual participant. A method for contacting the researchers if the participants had any questions about participation or the purpose of the study was also provided.

Measure Development

The process for developing the JCAT was based on Hinkin's six-step framework for survey development.¹⁹ The current study undertook the first four steps in this process: 1) item generation, 2) questionnaire administration, 3) initial item reduction and 4) confirmatory factor analysis. The design of the JCAT was driven by a comprehensive review of (a) the relevant literature specific to just culture, (b) safety culture literature in general, and (c) current existing measures of safety culture and their appropriate relevance to, or deviation from, conceptualizations of the constructs of interest. Primary analyses of the data included a series of confirmatory factor analyses (CFA) using EQS version 5.0 structural equation modeling software, in which the original model was revised using empirically identified and conceptually relevant modifications. Reliability estimates associated with the refined JCAT subscales were also calculated.

Item and dimension generation—Step one in the measurement process was to generate items, which entailed: 1) developing the items for the survey and 2) assessing these items for content validity. This first process used a deductive approach which relied on relevant theory, empirical research, and expertise to develop and define the dimensions and survey items.

Defining just culture—A just culture describes a work environment in which individuals believe they will receive fair and just treatment when involved in an adverse event.^{3,12,15-17} The key to providing a fair outcome is the extensive follow-up and evaluation process that

accompanies an adverse event. The goal of this process is to determine whether an adverse event occurs as a result of a system error, which requires a multi-level failure across the organization, or if the event occurred solely because of the actions of an individual.^{3,12} By using the framework of striving for a balance between blameless and blameworthy, individual involvement in system-level events would receive a non-punitive treatment. If a follow-up process determines an individual was solely responsible for the event, this scenario would warrant a higher level of accountability for that individual. For this balanced approach to be effective, it is important to have bi-directional communication about the process: staff members must be willing to openly communicate about events and hospital leaders must be willing to provide feedback and updates about how that information is being used to improve patient safety.^{3,12,15-17,20}

Despite the popularity of the just culture concept, few have ventured to provide a formal definition; therefore, as clarification for future researchers and practitioners, it is beneficial to aggregate the existing definitions and descriptions into one that is universally applicable across healthcare settings. Providing a holistic definition of just culture in the context of healthcare is not only key to the design process of developing the current measure (i.e., part of step 1 of the Hinkin measurement development guide¹⁹), but meaningful for future research on just culture. Considering the definitions that do exist, three stand out as the most relevant to healthcare and/or most pervasive in the literature, and were subsequently used to construct the current definition. As previously mentioned, Reason is credited for just culture's inception and he defines it as “a collective understanding of where the line should be drawn between blameless and blameworthy actions”.³ Taking this conceptualization, David Marx adapted the concept to healthcare with his 2001 primer that is widely regarded as the cornerstone publication for just culture's application to healthcare settings.¹² Based on Marx's publication, AHRQ defines just culture as one that “...recognizes that competent professionals make mistakes and acknowledges that even competent professionals will develop unhealthy norms (shortcuts, “routine rule violations”), but has zero tolerance for reckless behavior.”²¹ The last definition comes from the policy position of the American Society for Health-System Pharmacists (ASHP). It too is based on the work by Marx but also includes additional elements from other sources: “A just culture is one that has a clear and transparent process for evaluating errors and separating events arising from flawed system design or inadvertent human error from those caused by reckless behavior, defined as a behavioral choice to consciously disregard what is known to be a substantial or unjustifiable risk”.

To develop a just culture assessment tool, the study's authors who were well versed in the just culture construct and its body of literature synthesized the existing definitions. The following was used to guide the current research, “a just culture for safety describes an environment where professionals believe they will receive fair treatment if they are involved in an adverse event and trust the organization to treat each event as an opportunity for improving safety”.

Just culture dimensions—The subscales or dimensions of the construct were developed based on just culture literature and theory as well as conceptual foundations used to develop other patient safety culture surveys.^{3,8-10,12,13,15-17} This review process yielded the

following dimensions to fully capture the spectrum of just culture perceptions: *balance* (composed of both non-punitive treatment as well as accountability), *trust*, *openness of communication*, *quality of the event reporting process*, *feedback and communication about events*, and an *overall goal of continuous improvement* (for definitions, see Table 3). Items were then written to reflect first-person perceptions of each sub-scale with responses comprised of 7-point Likert scales with anchors that ranged from 1 “strongly disagree” through 7 “strongly agree.”

The next phase in the item generation process was to conduct an informal content validity assessment of the dimensions and the items that were written to match. Several healthcare professionals were asked to review the initial list of questions and provide feedback. These individuals were well-versed on just culture concepts and included quality management professionals and the hospital's medication safety officer. Specifically, they were asked whether any of the questions were confusing and if any of the items seemed unrelated to the others. Their feedback was used to further refine the survey.

From this process, 31 items were retained (See Appendix for the final version of the measure) with the goal of assessing the six dimensions of just culture and one higher order dimension representing just culture as a whole: feedback and communication (e.g., “We don't know about events that happen in our unit”), openness of communication (e.g., “Staff can easily approach supervisors with ideas and concerns”), balance (e.g., “Staff members fear disciplinary action when involved in an event”), quality of the event reporting process (e.g., “The event reporting system is easy to use”), overall goal of continuous improvement (e.g., “The hospital sees events as opportunities for improvement”), and trust (e.g., “I trust that I will be treated fairly when involved in an event”). As the examples demonstrate, the JCAT includes both positively and negatively worded questions.

Results

Missing data

Of the 998 healthcare professionals to whom the survey was administered, 404 (40.4%) responded. Demographic data for participants are given in Table 1 and their sample tenures in Table 2. Each item was evaluated for missing or insufficient data. Missing data were treated conservatively: rather than estimating or replacing large amounts of missing data, surveys in which participants did not respond to more than 2 of the 31 questions were excluded from analysis. This exclusion criterion was determined by a qualitative review of the distribution of missing responses (i.e., participants who did not respond to more than 2 items generally tended to constitute a group who omitted more than 3 items overall). By using this cutoff criterion, 366 of the surveys were included in the primary analysis and 38 were rejected.

Confirmatory Factor Analyses

Given that the JCAT was created to assess six conceptually important dimensions of just culture, and one higher order factor representing just culture as a whole (resulting in testing a seven-factor model), confirmatory factor analytic (CFA) techniques were used with EQS

version 5.0 structural equation modeling software to assess the statistical fit of the measure. Results indicated relatively poor fit of the original model ($\chi^2 = 1165.98$, $df = 422$, $p < 0.01$, $CFI = .83$, $RMSEA = 0.07$) with the comparative fit index (CFI) below a commonly accepted rule of thumb (i.e., $CFI > .95$). Alternatively, the root mean square error of approximation was close to a commonly accepted rule of thumb ($RMSEA < .06$).²³ Due to the weaknesses of the original model, the analysis shifted from a purely theory-driven confirmatory approach to an exploratory approach with a theoretical base.

Subsequent model testing utilized results from the Lagrange Multiplier Test. This technique provides suggestions for improving the statistical fit of the model by deleting or reassigning items to different factors. The current analyses yielded recommendations to reassign two items to different factors, yet, given that the Lagrange results are strictly mathematical, the items were only assigned to an alternate factor if the item was conceptually consistent with the other items associated with that factor. Based on these recommendations, the item, “Staff members use event reporting to ‘tattle’ on each other” was taken from *overall goal of continuous improvement* and reassigned to *balance*. Additionally, “I trust supervisors to do the right thing” was moved from *trust* and reassigned to *openness to communication*.

Next, the results from individual items were examined to possibly eliminate those that did not make a meaningful contribution to the measure. Although all parameter loadings were statistically significant, four items with relatively modest loadings (i.e., less than 0.40) underwent additional review. These four items had a high neutral response rate from participants, for which more than 25% of the participants selected a neutral response. Upon further review, it is possible that respondents might have seen these items as confusing or not applicable. Thus, items with a neutral response rate of 25% or greater were removed from the model and fit was reassessed. Although these changes resulted in improved model fit ($\chi^2 = 821.817$, $df = 312$, $p < 0.01$, $CFI = .87$, $RMSEA = 0.067$) the CFI was still less than conventional rules of thumb.

Although the model fit was less than desirable, no additional modifications produced a conceptually meaningful model. Table 4 lists the loadings for each item in the revised 7-factor (the six subscales plus one higher order just culture dimension) model with 27 items. As previously mentioned, two items were reassigned from their original factors. All factor loadings were significant at $p < .05$.

Reliability Analysis

Table 5 lists the internal consistency estimates for each dimension of the revised JCAT. Cronbach's alphas for all dimensions except *quality of the event reporting process* ($\alpha = .63$) (attempts to improve this dimension by dropping items were made, but these did not improve the Cronbach's alpha) were greater than .70. Despite the relatively poor internal consistency of *quality of the event reporting process*, this dimension is considered theoretically essential to the understanding of just culture and warrants inclusion in the JCAT.²⁴

Discussion

The approach to medical error and patient safety cultural perspectives has shifted dramatically over the last several decades. For many years, the primary response to medical error was individual blame, which prompted Dr. Lucian Leape, a leading expert on medical error, to testify before Congress that “The single greatest impediment to error prevention is that we punish people for making mistakes.”²⁵ Such criticism of the extreme focus on the blame directed at individuals involved in medical errors prompted a radical shift towards a strictly non-punitive approach. However, this non-punitive approach has been criticized as lacking individual accountability when errors are due to neglect, recklessness, or a direct disregard for safety protocols.¹²

A just culture for patient safety attempts to strike a balance between the punitive and non-punitive approach by determining whether an event occurred due to a systems-level issue or directly from the actions of an individual.^{3,12} When investigating events, a just culture should promote fairness by introducing a transparent and reproducible method for investigating events, which should reduce fear and blame that can be associated with involvement with adverse events. For example, if a nurse administers an incorrect dose of medication to a patient, a just culture response to such an event would first take steps to assess whether the harm was purposeful. While an important step in the evaluation, such instances are rare and usually quickly eliminated from the list of possible causes. The investigation would then proceed to determine if the situation involved human error, at-risk behavior (a choice to consciously disregard a substantial and unjustifiable risk), or reckless behavior, and appropriate consequences consistent with the behavior would be provided. Employees should be consoled when the investigation indicates human error and coached for at-risk behavior, but punitive action should be taken for reckless behavior. Using this approach many events are determined to have system causes, but a framework exists for consistent individual accountability when appropriate.

Careful application of just culture concepts should result in fair treatment of employees that generates a sense of trust. This trust should facilitate an atmosphere of open safety communication across all levels of patient care. It is expected that such an environment will generate an increase in voluntary error reporting.^{12,15,16,26} These benefits have compelled hospital leaders to seek methods for developing and growing a just culture within their organizations; however, there has been no published research that demonstrates whether a just culture is associated with valued outcomes.^{16,26,27} A tool to measure and assess just culture will assist healthcare leaders in efforts to implement just culture and facilitate further research.

The purpose of this study was to design a measure of just culture to provide a scientific framework for studying the concept and a tool for healthcare leaders to use in their efforts to improve patient safety. While the instrument was designed to assess the perceptions of those directly involved in patient care (i.e., those most likely to affect patient safety), it should be noted that the adoption of a just culture perspective is most effective when it is embraced by the organization in its entirety.^{12,16} The current results indicate that the most preferred version of the JCAT was a 7-factor model with the six dimensions of just culture loading

onto a single higher order factor. These results provide some support, for the logical assumption that just culture is a higher order concept composed of distinct dimensions.^{16,24,27,28} Weiner et al., called for a method of studying just culture that allowed researchers to understand how individual healthcare providers differed in their preferences and perceptions of justice systems.²⁷ The development of the JCAT is a direct response to practical needs in that it allows for the measurement and interpretation of different aspects of just culture, and subsequently, how healthcare professionals might excel or struggle with each dimension.

This is a first attempt to measure a complex construct, and our approach has limitations. First, since there is no consensus on the definition of just culture and its dimensions, this measure may not capture all aspects of the just culture construct. However, the development of this instrument was guided by a careful examination of the just culture literature. There are two external validity concerns. First, data were collected at a pediatric research hospital and may not be applicable in other settings. Second, the same sample was used for scale development and testing psychometric properties. Best practices would use two samples with one to test the initial confirmatory factor analysis, make corrections based on improving statistical fit, and use a second sample to test those corrections.²⁹ This also relates to steps five and six of the Hinkin guide to developing measures. Step five gathers evidence for convergent/discriminant validity (do the constructs in the survey appropriately align-with/discriminate-from those in other measures), and step six attempts to replicate original results in another setting.¹⁹ A third limitation is that presentation of the JCAT and the AHRQ was not varied. This could have resulted in an ordering effect that biased responses. Future research should use counter balancing to control for this possible effect when multiple measures are administered in the same study. Given that the JCAT was administered in tandem with the AHRQ patient safety culture survey, there is an opportunity to examine the two measures at a structural level. Although a comparison of the two measures was not the focus of the current study, psychometric similarities and differences between the JCAT and the AHRQ measure (as well as other patient safety culture surveys) can be analyzed in future studies to detect for convergent/discriminate validity and strengthen the JCAT. Such studies may provide evidence of the JCAT and its dimensions being distinct, thus supporting its unique contributions to measuring patient safety culture. Future research should also focus on measuring just culture perceptions of hospital staff who are not directly involved in patient care. Although this was not an objective of the current study, just culture should be championed by hospital leaders and adopted by all staff members.^{12,16} As just culture further spreads throughout healthcare settings, future research should consider both individual perceptions of just culture and an organizations' ability to differentiate human error, at-risk behavior, and reckless behaviors. Distinguishing among these appropriately is a crucial component in the effective practice of just culture's approach to error.¹²

Conclusion

A healthy just culture for patient safety in healthcare settings is invaluable in its ability to promote an open, non-threatening atmosphere of communication related to medical events and errors. Its fair and balanced approach should contribute to greater levels of voluntary

event reporting, an adherence to best safety practices, and ultimately, a reduction in medical errors. Yet in order to improve and further instill the elements of a just culture, it is first necessary to effectively measure one's current strengths and weaknesses. Measurement is the first step in the research-intervention cycle, which includes feedback on results, clarification of responses by using more in-depth methods such as interviews or focus groups, applying revisions to policies and processes, and repeat measuring at the appropriate time. The JCAT is the first attempt to provide healthcare practitioners and researchers with a tool that can be used to measure and then direct one's resources toward improving various aspects of a just culture for patient safety. Future research should extend the current efforts and refine this necessary measure.

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Appendix: Just Culture Assessment Tool (JCAT) Final Version

Feedback and Communication

The management does a good job of sharing information about events.

We don't know about events that happen in our unit.

I often hear about event conclusions and outcomes.

Openness of Communication

Staff feel uncomfortable discussing events with supervisors.

Supervisors respect suggestions from staff members

Staff can easily approach supervisors with ideas and concerns.

If I had a good idea for making an improvement, I believe my suggestion would be carefully evaluated and taken seriously.

I trust supervisors to do the right thing.

Balance

Staff members are usually blamed when involved in an event.

Staff members fear disciplinary action when involved in an event.

When an event occurs, the follow up team looks at each step in the process to determine how the event happened.

I feel comfortable entering reports about events in which I was involved.

Staff members use event reporting to "tattle" on each other.

Quality of event reporting process

Coworkers discourage each other from reporting events.

The event reporting system is easy to use.

Reports are being evaluated and reviewed after they're entered.

I'm given time to enter event reports during work hours.

My supervisors encourage me to report.

Continuous Improvement

There are improvements because of event reporting.

The hospital devotes (time/energy/resources) toward making patient safety improvements.

By entering reports, I'm making the hospital a safer place for the patients.

The hospital sees events as opportunities for improvement.

Trust

The hospital uses a fair and balanced system when evaluating staff involvement in events.

I trust that the hospital will handle events fairly.

The hospital adheres to its own rules and policies.

I feel comfortable entering report where others were involved.

I am uncomfortable with others entering reports about events in which I was involved.

References

1. Clarke S. The relationship between safety climate and safety performance: a meta-analytic review. *J Occup Health Psychol.* Oct; 2006 11(4):315–327. [PubMed: 17059296]
2. Leape LL, Berwick DM, Bates DW. What practices will most improve safety? Evidence-based medicine meets patient safety. *JAMA.* Jul 24-31; 2002 288(4):501–507. [PubMed: 12132984]
3. Reason, J. Managing the risks of organizational accidents. Aldershot: Ashgate; 1997.
4. Kohn, L.; Corrigan, J.; Donaldson, M. To Err is Human: Building a safer health system. Washington, D.C.: National Academy Press; 2000.
5. Reason J. Human error: Models and management. *BMJ.* 2000; 320(7237):768–70. [PubMed: 10720363]
6. Weick, KE.; Sutcliffe, KM. Managing the unexpected: Resilient performance in an age of uncertainty. 2nd. San Francisco (CA): Jossey-Bass; 2007.
7. Chassin MR, Loeb JM. The ongoing quality improvement journey: Next stop, high reliability. *Health Affairs.* 2011; 30(4):559–568. [PubMed: 21471473]
8. Sorra, J.; Nieva, V. Hospital Survey on Patient Safety Culture. Rockville, MD: Agency for Healthcare Research and Quality; 2004.
9. Pronovost P, Sexton B. Assessing safety culture: guidelines and recommendations. *Qual Saf Health Care.* Aug; 2005 14(4):231–233. [PubMed: 16076784]

10. Singla AK, Kitch BT, Weissman JS, Campbell EG. Assessing Patient Safety Culture: A Review and Synthesis of the Measurement Tools. *J Patient Saf.* 2006; 2(3):105–115.
11. Muething SE, Goudie A, Schoettker PJ, et al. Quality improvement initiative to reduce serious safety events and improve patient safety culture. *Pediatrics.* Aug; 2012 130(2):e423–431. [PubMed: 22802607]
12. Marx, D. Patient safety and the “just culture”: A primer for healthcare executives. New York: Columbia University; 2001.
13. Vogelsmeier A, Scott-Cawiezell J, Miller B, Griffith S. Influencing leadership perceptions of patient safety through just culture training. *J Nurs Care Qual.* Oct-Dec;2010 25(4):288–294. [PubMed: 20220531]
14. Reason, J. Comprehensive error management in aircraft engineering: A manager's guide. London: British Airways Engineering; 1995.
15. Wachter RM, Pronovost PJ. Balancing “no blame” with accountability in patient safety. *N Engl J Med.* Oct 1; 2009 361(14):1401–06. [PubMed: 19797289]
16. Connor M, Duncombe D, Barclay E, et al. Creating a fair and just culture: one institution's path toward organizational change. *Jt Comm J Qual Patient Saf.* Oct; 2007 33(10):617–624. [PubMed: 18030864]
17. Frankel AS, Leonard MW, Denham CR. Fair and just culture, team behavior, and leadership engagement: The tools to achieve high reliability. *Health Serv Res.* Aug; 2006 41(4 Pt 2):1690–1709. [PubMed: 16898986]
18. Sorra, J.; Famolaro, T.; Dyer, N., et al. Hospital Survey on Patient Safety Culture 2012 User Comparative Database Report. Rockville, MD: Agency for Healthcare Research and Quality; Feb. 2012 2012
19. Hinkin TR. A brief tutorial on the the development of measures for use in survey questionnaires. *Organizational Research Methods.* 1998; 1(1):104–121.
20. Sammer CE, Lykens K, Singh KP, Mains DA, Lackan NA. What is patient safety culture? A review of the literature. *J Nurs Scholarsh.* Jun; 2010 42(2):156–165. [PubMed: 20618600]
21. Agency for Healthcare Research and Quality. [Accessed May 21, 2012] 2012. On-line Glossary Available at: <http://psnet.ahrq.gov/glossary.aspx?indexLetter=J>
22. American Society of Health System Pharmacists. [Accessed May 21, 2012] 2011. Policy Position Available at: <http://www.ashp.org/DocLibrary/BestPractices/policypositions2011.aspx>
23. Hu L, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struct Equ Modeling.* 1999; 6(1):1–55.
24. von Thaden, TL.; Hoppes, M. Measuring a just culture in healthcare professionals: Initial survey results; Safety Across High-Consequence Industries Conference; St. Louis. 2005;
25. Leape, LL. Testimony Senate Committee on Health, Education, Labor and Pensions. Washington, DC; 1999. Available at: <http://md-jd.info/leap2001.html> [Accessed May 30, 2012]
26. Beyea SC. Creating a just safety culture. *AORN J.* Feb; 2004 79(2):412–414. [PubMed: 15002837]
27. Weiner BJ, Hobgood C, Lewis MA. The meaning of justice in safety incident reporting. *Soc Sci Med.* Jan; 2008 66(2):403–413. [PubMed: 17949876]
28. Khatri N, Brown GD, Hicks LL. From a blame culture to a just culture in health care. *Healthcare Management Review.* 2009; 34:312–322.
29. Jackson DL, Gillaspay JA, Purc-Stephenson R. Reporting practices in confirmatory factor analysis: An overview and some recommendations. *Psycholo Methods.* 2009; 14:6–23.

TABLE 1
Number of Participants by Staff Position^{a,b}

Staff Position	N	%/N
Registered Nurse	154	42%
Physician Assistant/Nurse Practitioner	28	8%
LVN/LPN	9	3%
Patient Care Asst/Hospital Aide/Care Partner	10	3%
Attending/Staff Physician	33	9%
Resident Physician/Physician in Training	7	2%
Pharmacist	25	7%
Technician (e.g., EKG, Lab, Radiology)	16	4%
Administration/Management	34	9%

^aTotal N = 366

^b50 Participants did not provide staff position information; therefore the information in the table does not represent the full sample.

TABLE 2
Sample Tenure in Years by Specialty, Hospital, & Work Unit^a

Years	Specialty N(%)	Hospital N(%)	Work Unit N(%)
< 1	14(4)	33(9)	44(14)
1 to 5	86(24)	121(33)	156(42)
6 to 10	69(19)	93(25)	89(24)
11 to 15	46(12)	51(14)	42(11)
16 to 20	45(12)	19(5)	14(4)
21+	105(29)	49(13)	21(6)

^aTotal N = 366

TABLE 3
Just Culture Assessment Tool (JCAT) Dimensions and Definitions

Dimension	Definition
<i>Balance</i>	One's perceptions of fair treatment within the hospital as it relates to errors, error reporting, and its systems approach to medical error.
<i>Trust</i>	The extent to which individuals trust the organization, their supervisors, and their co-workers.
<i>Openness of Communication</i>	The willingness of individuals to communicate event information upwards to supervisors and hospital administrators e.g., willingness to reveal events, share events information, and to make suggestions for improvement within the unit or the organization.
<i>Quality of the Event Reporting Process</i>	One's perceived quality of the event reporting system (which includes the process of entering reports and the ability to follow up on these reports), whether employees are given time to report, and to what extent the employees believe the reporting system is monitored and maintained.
<i>Feedback and Communication About Events</i>	One's beliefs regarding whether the organization does an effective job of sharing event information about the events and the outcome of evaluating events.
<i>Overall Goal of Continuous Improvement</i>	One's belief that the organization as a whole demonstrates a goal of continuous improvement, characterized by a willingness to learn from events and make improvements to the hospital system.

TABLE 4

Survey Item Loadings for the Revised 7-factor Model with 27 Items^{a,b,c}

Variable	Feedback and Communication	Openness of Communication	Balance	Quality of Error Reporting Process	Continuous Improvement	Trust
The management does a good job of sharing information about events.	.743 ^b					
We don't know about events that happen in our unit.	.859 ^b					
I often hear about event conclusions and outcomes.	.749 ^b					
Staff feel uncomfortable discussing events with supervisors.		.583 ^b				
Supervisors respect suggestions from staff members.		.749 ^b				
Staff can easily approach supervisors with ideas and concerns.		.707 ^b				
If I had a good idea for making an improvement, I believe my suggestion would be carefully evaluated and taken seriously.		.714 ^b				
I trust supervisors to do the right thing. ^c		.703 ^b				
Staff members are usually blamed when involved in an event.			.857 ^b			
Staff members fear disciplinary action when involved in an event.			.809 ^b			
When an event occurs, the follow up team looks at each step in the process to determine how the event happened.			.836 ^b			
I feel comfortable entering reports about events in which I was involved.			.662 ^b			
Staff members use event reporting to "tattle" on each other. ^c			.734 ^b			
Coworkers discourage each other from reporting events.				.560 ^b		
The event reporting system is easy to use.				.684 ^b		
Reports are being evaluated and reviewed after they're entered.				.757 ^b		
I'm given time to enter event reports during work hours.				.744 ^b		
My supervisors encourage me to report.				.725 ^b		
There are improvements because of event reporting.					.641 ^b	

Variable	Feedback and Communication	Openness of Communication	Balance	Quality of Error Reporting Process	Continuous Improvement	Trust
The hospital devotes (time/energy/resources) toward making patient safety improvements.					.524 ^b	
By entering reports, I'm making the hospital a safer place for the patients.					.566 ^b	
The hospital sees events as opportunities for improvement.					.702 ^b	
The hospital uses a fair and balanced system when evaluating staff involvements in events.						.845 ^b
I trust that the hospital will handle events fairly.						.829 ^b
The hospital adheres to its own rules and policies.						.668 ^b
I feel comfortable entering report where others were involved.						.700 ^b
I am uncomfortable with others entering reports about events in which I was involved.						.532 ^b

^aThis 7-factor model was composed of 6 subscales and 1 higher-order just culture dimension.

^bIndicates significance at $p < .05$.

^cIndicates item reassigned.

TABLE 5
Means, Standard Deviations, and Cronbach's Alpha Reliability Scores for Just Culture Dimensions

Dimension	<i>M</i>	<i>SD</i>	α	Number of items
1. Feedback and Communication	4.69	1.35	.74	3
2. Openness of Communication	5.51	1.17	.86	5
3. Balance	5.19	1.10	.78	5
4. Quality of Event Reporting Process	5.63	0.90	.63	5
5. Continuous Improvement	6.12	0.77	.78	4
6. Trust	5.38	1.01	.75	5