Hospital Administrative Staff vs. Nursing Staff Responses to the AHRQ Hospital Survey on Patient Safety Culture

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Abstract

The West Virginia Patient Safety Project is an Agency for Healthcare Research and Quality (AHRQ) funded, voluntary network of hospitals working to report, analyze, and learn from medical errors. As part of this project, we assessed the safety culture in 29 West Virginia rural hospitals using the AHRQ Hospital Survey on Patient Safety Culture in two measurement periods. We computed scores for each item and dimension on the survey for each hospital and generated reports to share with hospitals as a basis for interventions to improve their safety cultures. In general, nurses rated safety culture less positively than administrative staff in all hospitals, independent of duration of employment, hours worked, or work unit. Most differences were still evident after remeasurement, and in some cases they had increased. The continuing discrepancy in positive responses between administrative and nursing staff in several survey dimensions may be indicative of the need for more intensive interventions in certain areas of safety culture.

Introduction

Public and professional concern over patient safety, adverse health care events, and medical error has been increasing since before the beginning of the new millennium. Lucian Leape, Don Berwick, and others pioneered research on these topics in the 1990s.[1, 2, 3, 4, 5, 6, 7, 8, 9, 10] The landmark 1999 Institute of Medicine (IOM) report *To Err is Human* called for developing a "culture of safety" within health care organizations and defined many of the characteristics of such a culture.[11] Although creating a culture of safety in hospitals is the responsibility of all employees, to be successful it must be driven by senior management. Indeed, it has been said that "…leadership is the critical element in a successful patient safety program and is non-delegable."[12] To understand where to focus efforts in building this environment, hospital senior management and administrators must be cognizant of the opinions and beliefs of the frontline staff regarding the safety culture of their facility.

Shortly after the release of the IOM report, the West Virginia Medical Institute (WVMI)—the Medicare Quality Improvement Organization for West Virginia, Delaware, and Pennsylvania—convened leaders of West Virginia's hospitals and physicians to develop a statewide plan to address medical errors. Out of this grew the West Virginia Patient Safety Project, a voluntary network of hospitals working together to report, analyze, and learn from medical errors. This

project was greatly expanded in 2004 to include more hospitals and organizational partners, with the support of a cooperative agreement from the Agency for Healthcare Research and Quality (AHRQ; grant UC1 HS01 4920-02). As part of this project, we assessed the safety culture in West Virginia hospitals using a standard instrument. This report presents findings of the baseline and remeasurement surveys and describes systematic differences in attitude toward patient safety between nurses and administrative staff in West Virginia hospitals.

Methods

We originally recruited 29, mostly rural acute care hospitals (including 16 critical access hospitals) in West Virginia to participate in the voluntary patient safety event-reporting system component of the project. This represented a majority of the 34 acute care hospitals in the State. After recruitment, staff in each hospital received training on the system. In conjunction with the training, we administered the AHRQ Hospital Survey on Patient Safety Culture[13] to participants. We also left extra copies of the survey at each hospital to be distributed to staff that could not attend the training. We attempted to reach as many staff as possible, but we could not control attendance at the training or enforce a response; therefore, the sampling methodology was not uniform across hospitals. We also had no way to determine denominators to establish response rates by facility. However, the hospitals involved estimated their staff participation rates as between 25 percent (for the smallest critical access hospitals) and 75 percent (for larger facilities). The baseline survey was administered between January and October 2005.

At approximately the midpoint of the 3-year AHRQ grant, we resurveyed participating hospitals to determine if attitudes and beliefs concerning the patient safety culture of each hospital had changed since baseline. Only 26 hospitals participated at remeasurement: one facility did not participate due to the timing of the survey; one merged with a larger hospital; and one used a different survey mechanism in the remeasurement period. Surveys were again administered on site in each facility. The remeasurement survey was administered between July and September 2006. Again, survey sampling methodology and response were determined by the individual facility and were not uniform across facilities.

The AHRQ Hospital Survey on Patient Safety Culture consists of 12 dimensions of safety culture. Each dimension comprises three or four items, for a total of 42 survey items. The survey used a 5-point Likert scale, where 1 = strongly disagree; 2 = disagree; 3 = neither; 4 = agree; and 5 = strongly agree. For questions assessing frequency of event reporting, 1 = never; 2 = rarely; 3 = sometimes; 4 = most of the time; and 5 = always.

Eighteen of the items are reverse-worded; that is, disagreement implies a more favorable patient safety culture. For example, item A10 (reverse-worded) states, "It is just by chance that more serious mistakes don't happen around here." This compares item A18 (non-reverse-worded), "Our procedures and systems are good at preventing errors from happening." Scoring takes these differences into account.

In addition, the survey captures several demographic variables, such as hospital work area, number of events reported, length of time worked in the hospital, length of time in current work area, length of time in current specialty or profession, hours worked per week, staff position, and

whether or not the respondent has direct interaction with patients. Respondents are also asked to give their work area/unit a grade on patient safety.

Respondents completed the survey on an optically scanned form, which was converted to digital data using Teleform® software. Free-text comments were collected and manually entered into the dataset. For the 42 response items, 12 dimension scores were constructed as specified in the survey documentation.[14] We computed scores for each item and dimension for every participating hospital and generated hospital-level reports at both baseline and remeasurement.

For all participating hospitals, we calculated scores as above and examined the relationship between scores and demographic variables using 2-way frequency tables, consolidating levels of multilevel variables when appropriate. (For example, for the demographic variable "staff position in the hospital," we combined the positions for registered nurse, licensed vocational nurse, licensed practical nurse, physician assistant, and nurse practitioner into one category, "nursing.") We compared scores with the AHRQ benchmark, a published set of national norms on the instrument representing 382 hospitals and over 108,000 respondents.[14]

In preliminary analyses of the baseline data, we discovered apparently consistent differences in response patterns by respondent position in the hospital. To investigate this further, we identified a subset of respondents with the most extreme answers and conducted additional analyses on this subset. In the subset, we computed relative risk of a positive response to each item by position, where a positive response was 4 or 5 for items worded normally and 1 or 2 for reverse-worded items. Where we found significant differences between job classes, we tested for confounding by other demographic characteristics.

These differences by respondent position in the hospital persisted in the remeasurement data and in some cases increased. Analyzing these differences is the focus of this study.

We used SAS® version 9.1 (SAS Institute, Cary NC) for statistical analysis. We considered a probability value of <0.05 to be statistically significant.

Results

Demographic characteristics were quite similar for both measurement periods. There were 1,967 respondents to the survey from 29 West Virginia hospitals at baseline and 1,717 responses from 26 hospitals at remeasurement. The median number of respondents per hospital was 52.5 at baseline (10th to 90th percentile range 15.8 - 96.6) and 47.0 at remeasurement (10th to 90th percentile range 22.5 - 149.0). We were unable to determine denominators, as we did not have information on staffing levels and thus were not able to establish response rates.

In the baseline survey, 661 (33.6 percent) of the respondents were nonphysician providers (including nurse practitioners and physician assistants, although the majority were registered nurses and licensed practical nurses), and 333 (16.9 percent) were administration/management. At remeasurement, 578 (33.7 percent) respondents were nursing staff, and 225 (13.1 percent) were administration/management. These two groups accounted for 50.5 percent of total responses at baseline and 46.8 percent at remeasurement. The remaining categories of employees

were ancillary health care, clerical, and others. Physicians (two respondents statewide at baseline and six at remeasurement) were remarkable for their low participation; they are counted in the "Other" group, as are the somewhat more numerous pharmacists (34 statewide at baseline and 21 at remeasurement) (Table 1).

Respondents generally were long-term employees in their hospitals, with 848 (43.3 percent) at baseline and 667 (39.4 percent) at remeasurement having worked in the same hospital longer than 10 years. Similarly, more than 25 percent of respondents at both baseline and remeasurement had been in the same profession more than 20 years. Nearly three-quarters of the respondents reported direct patient contact at baseline and remeasurement, 1,414 (71.9 percent) and 1,296 (75.5 percent), respectively.

Table 1.   Respondent job classification State-wide West Virginia survey of hospital patient safety culture

Job classification	N (%)	
	Baseline	**Remeasurement**
Administration/management	333 (16.9)	225 (13.1)
Clerical	198 (10.1)	193 (11.2)
Nursing/physician assistant	661 (33.6)	578 (33.7)
Ancillary health care	386 (19.6)	413 (24.1)
Other and unknown[a]	389 (19.8)	308 (17.9)
Total	1,967	1,717

a   Includes pharmacists, physicians, other, unknown, and no response.

Total respondents' views on patient safety are illustrated in Figure 1, which presents scores for each of the 12 dimensions at both baseline and remeasurement, compared to AHRQ benchmarks. The scores represent the percent of respondents answering each item in the dimension positively. For most dimensions of patient safety culture, West Virginians rated their hospitals the same or better than AHRQ benchmark participants. Exceptions included "nonpunitive response to error" and "hospital handoffs and transitions," where West Virginia hospitals scored below the nationwide AHRQ benchmarks. No significant differences were noted among overall scores at baseline and remeasurement in any of the patient safety dimensions (Table 2).

However, when we examined responses by job position, consistent patterns emerged. We found large and consistent differences between nurses and administrators in the global patient safety grade. This one item explains, on average, almost 10 percent of the variance in every other item in the survey. We also noted in the baseline analysis that nursing staff tended to rate safety culture lower and administrative staff higher, compared to the rest of the respondents, and that nurses' and administrators' responses to individual items often defined the extremes. This discrepancy persisted in remeasurement and in some cases even increased. Figure 2 illustrates this point, showing the patient safety dimension scores for nurses and administrators in West Virginia at both baseline and remeasurement.

For all dimensions but two ("Frequency of Events Reported" and "Handoffs & Transitions"), administrative staff rated safety conditions higher than nurses at baseline; in most cases
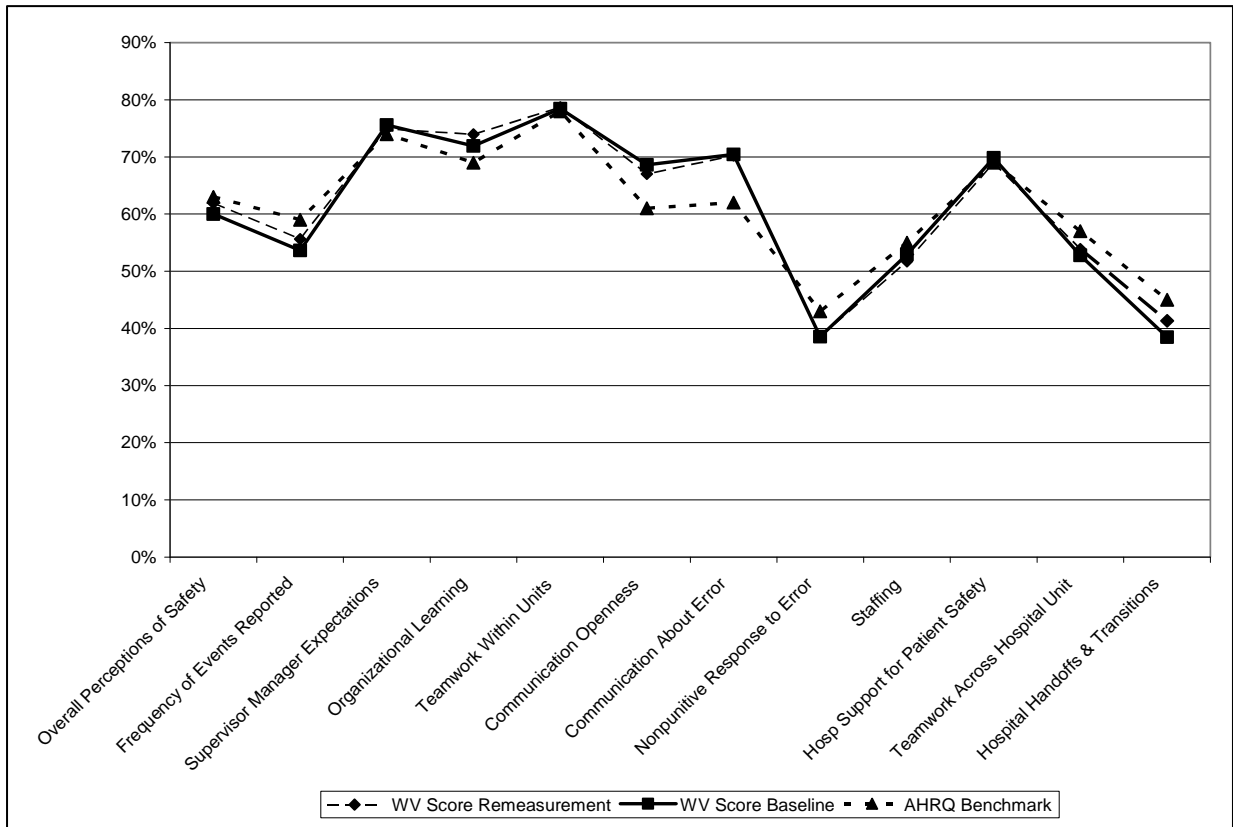
Figure 1. Responses to baseline and remeasurement hospital survey on patient safety culture by dimension West Virginia vs. AHRQ benchmark. Dimensions are groups of survey items testing similar themes. "Positive" responses are agreement or strong agreement to positively-worded items, and disagreement or strong disagreement with reverse-worded items. Note: Although the data do not represent a time series, this format was chosen for clarity.

significantly so (Table 3). At remeasurement, in only "Frequency of Events Reported" did nursing staff continue to score more positive responses than administrative staff.

Several of the dimensions of patient safety showed significant changes in positive response rate from baseline to remeasurement, both between administrative and nursing staff and among each of the types individually. Dimensions in which the gap between these positions increased included:

- **Nonpunitive response to error**. This dimension, which denotes the extent to which staff feel that their mistakes and event reports are not held against them and that mistakes are not kept in their personnel file, showed a large and widening gap in positive responses between administrative and nursing staff. At baseline, administrative staff's positive score exceeded nursing staff's score by 12.7 percent; at remeasurement, the gap had increased to 17.6 percent. Almost the entire increase was due to administrative staff's rise in positive score between baseline (48.8 percent) and remeasurement (55.2 percent); no similar increase occurred among nursing staff. Additionally, this dimension had the lowest overall score among nursing staff, at 36.1 percent.

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Table 2. Positive responses to hospital survey of patient safety culture by dimension and job classification (administration vs. nursing), West Virginia baseline and remeasurement and AHRQ benchmark

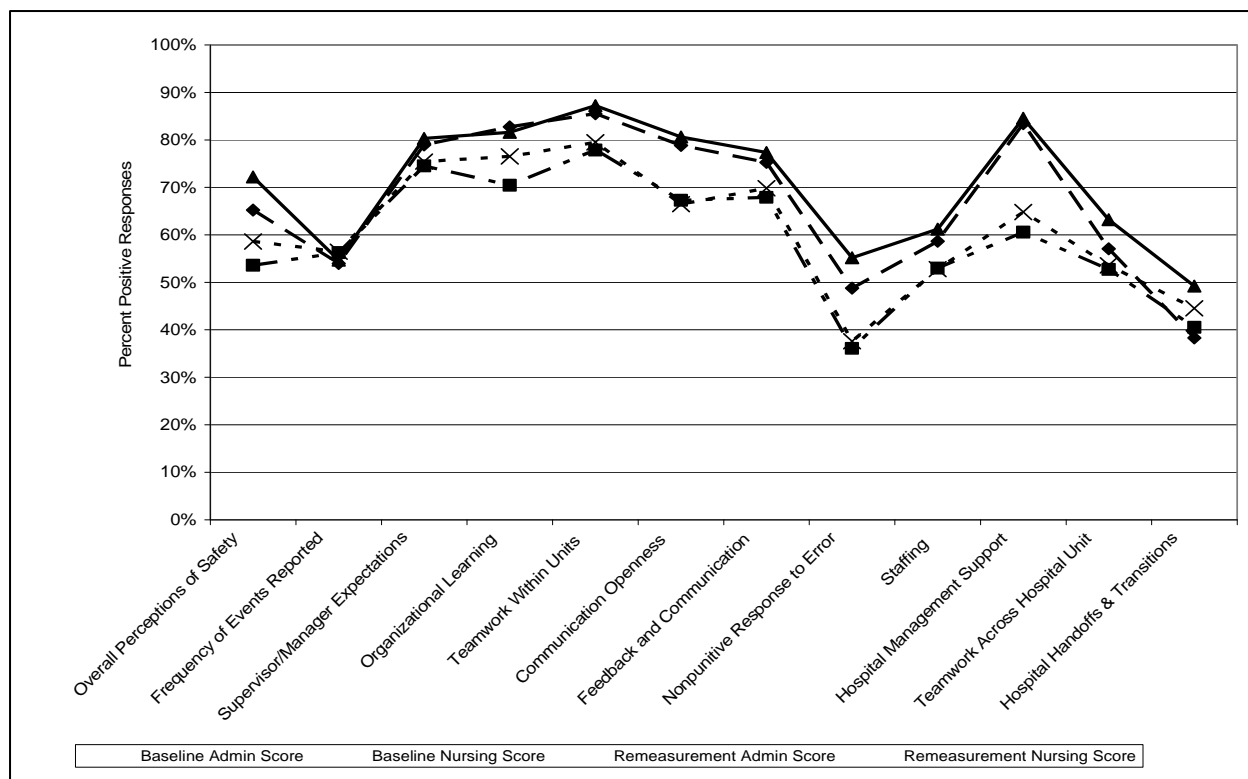| Safety culture dimension	Baseline score Admin (%)	Baseline score Nursing (%)	χ^2	Remeasurement score Admin (%)	Remeasurement score Nursing (%)	χ^2	Change (%)	AHRQ benchmark (%)
Overall perceptions of patient safety	65.2	53.6	50.63 $P<0.001$	72.2	58.6	50.24 $P<0.001$	2.0	63.0
Frequency of events reported	54.0	56.3	1.37 $P=0.24$	54.7	56.5	0.59 $P=0.44$	0.5	59.0
Supervisor/manager expectations & actions promoting patient safety	79.0	74.5	10.90 $P<0.001$	80.3	75.4	8.52 $P=0.003$	0.4	74.0
Organizational learning – continuous improvement	82.7	70.4	46.10 $P<0.001$	81.6	76.5	7.12 $P=0.007$	-7.2	69.0
Teamwork within units	85.5	77.8	31.33 $P<0.001$	87.2	79.5	25.53 $P<0.001$	0.0	78.0
Communication openness	78.8	67.3	42.02 $P<0.001$	80.6	66.5	45.55 $P<0.001$	2.6	61.0
Feedback & communication about error	75.3	67.9	17.30 $P<0.001$	77.4	69.8	13.32 $P<0.001$	0.2	62.0
Nonpunitive response to error	48.8	36.1	41.85 $P<0.001$	55.2	37.6	60.66 $P<0.001$	4.9	43.0
Staffing	58.6	53.0	14.35 $P<0.001$	61.2	52.8	18.04 $P<0.001$	2.7	55.0
Management support for patient safety	83.4	60.6	156.80 $P<0.001$	84.6	64.8	89.13 $P<0.001$	-3.1	69.0
Teamwork across units	57.1	52.7	4.66 $P=0.03$	63.2	53.6	23.76 $P<0.001$	5.3	57.0
Handoffs & transitions	38.3	40.5	2.43 $P=0.12$	49.2	44.5	5.56 $P=0.018$	6.9	45.0

Figure 2. Responses to hospital survey on patient safety culture by dimension and job classification (administration vs. nursing) West Virginia baseline and remeasurement. Dimensions are groups of survey items testing similar themes. "Positive" responses are agreement or strong agreement to positively-worded items, and disagreement or strong disagreement with reverse-worded items. "Admin" denotes West Virginia hospital staff who are administrators or managers; "Nursing" denotes nurses, nurse practitioners, or physician assistants. Note: Although the data do not represent a time series, this format was chosen for clarity.

- **Communication openness.** This dimension indicates the extent to which staff freely speak up if they see something that may negatively affect a patient and feel free to question those with more authority. This dimension showed an increase in the gap between nursing and administrative staff's positive response rates, from 11.5 percent (absolute) at baseline to 14.1 percent at remeasurement, but there was no significant increase in scores.

- **Teamwork across units.** This dimension is defined as the extent to which hospital units cooperate and coordinate with one another to provide the best care for patients. The positive scores for this dimension showed a fairly small gap between administrative and nursing staff at baseline (4.3 percent), which widened to 9.6 percent at remeasurement. This widening gap was due almost entirely to an increase in positive scores among administrative staff from 57.1 percent to 63.2 percent.

- **Staffing.** This dimension is defined as the extent to which there are enough staff to handle the workload, and work hours are appropriate to provide the best care for patients. The gap in positive responses between administrative and nursing staff increased slightly between baseline and remeasurement, from 5.7 percent to 8.4 percent. This was due to a slight increase in administrative staff's positive score on this dimension, combined with a slight decrease in nursing staff's positive score.

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There were two dimensions in which the gap between nursing and administrative staff decreased, one significantly. These were:

- **Organizational learning – continuous improvement**. This dimension—which indicates the extent to which there is a learning culture in which mistakes lead to positive changes— showed the greatest narrowing of the gap between nursing and administrative staff of any dimension of patient safety culture. The difference in positive response rates between the two at baseline, 12.3 percent (absolute), had been narrowed to 5.1 percent at remeasurement. However, this change was due almost entirely to improvement in nursing staff's positive response from 70.4 percent to 76.5 percent, which was the greatest increase among nurses in any dimension score. Administrative staff's positive score in this dimension actually decreased by 1.1 percent.

Table 3. West Virginia responses to baseline and remeasurement hospital survey on patient safety culture by dimension

Dimension	Score	
	Baseline (%)	Remeasurement (%)
Overall perceptions of safety	60.0	61.9
Frequency of events reported	53.6	55.6
Supervisor manager expectations	75.6	74.9
Organizational learning	71.9	73.9
Teamwork within units	78.4	78.7
Communication openness	68.6	67.0
Communication about error	70.4	70.3
Nonpunitive response to error	38.6	38.6
Staffing	52.9	51.7
Hospital support for patient safety	69.8	68.9
Teamwork across hospital unit	52.8	53.9
Hospital handoffs & transitions	38.5	41.3

- **Management support for patient safety.** This dimension indicates the extent to which hospital management provides a work climate that promotes patient safety and shows that patient safety is a top priority. By far, this dimension had the greatest discrepancy in positive scores between nursing and administrative staff. At baseline this discrepancy was 22.9 percent, with administrative staff giving a positive score of 83.4 percent, and nursing staff giving a positive score of 60.6 percent. At remeasurement this gap had narrowed slightly, to 19.8 percent, but it still remained the largest discrepancy of any dimension.

Dimensions in which the gap between nursing and administrative staff remained relatively unchanged included:

- **Overall perceptions of patient safety**. Both administrative and nursing staff's positive response rate to this global dimension increased significantly from baseline to remeasurement. However, the large gap between the two changed little and, in fact, increased slightly, from 11.6 percent (absolute) to 13.6 percent.

- **Frequency of events reported.** Scores in this dimension remained relatively unchanged between baseline and remeasurement, with just over half of both nursing staff and administrative staff giving it a positive score during both measurement periods.

- **Teamwork within units.** Positive scores in this dimension remained relatively unchanged, with a 7.7 percent gap between nursing and administrative staff at both baseline and remeasurement. However, both groups rate this dimension relatively high, with administrative staff scores of 85.5 percent to 87.2 percent (baseline to remeasurement) and nursing staff scores of 77.8 percent to 79.5 percent (baseline to remeasurement).

- **Feedback & communication about error.** This dimension signifies the extent to which staff are informed about errors that happen, given feedback about changes implemented, and discuss ways to prevent errors. Scores for both groups remained relatively unchanged from baseline to remeasurement, and the gap in positive scores between administrative and nursing staff also did not change significantly, remaining at about 7.5 percent.

- **Handoffs & transitions.** This dimension signifies the extent to which important patient care information is transferred across hospital units and during shift changes. This dimension garnered the lowest positive score from administrative staff at both baseline and remeasurement, although it is the dimension that also showed the greatest increase among that group from baseline (38.3 percent) to remeasurement (49.2 percent). Nursing staff's positive responses also increased, although not as greatly as the administrative staff. This dimension was one of two in which nursing staff's positive responses were higher than those of the administrative staff at baseline (although not at remeasurement).

Discussion

We have presented summary data from acute care and critical access hospitals in West Virginia, showing significant and, in some cases, widening differences between nursing staff and administrative/management staff attitudes about patient safety in their hospitals.

While the perceptions of all staff are important, any large discrepancy between frontline staff (those with direct patient contact) and management/administrative staff is of particular concern. To understand where to focus efforts in building a safety culture environment, hospital senior management and administrators must be cognizant of the opinions and beliefs of the frontline staff regarding the safety culture of their facility.

Although not the focus of this report, one of the goals of the wider West Virginia Patient Safety Project was to help hospitals improve their patient safety culture. This was to be done in part by supplying them with the results of their Hospital Survey on Patient Safety Culture, with the expectation that facilities would use this information to drive interventions to improve their culture of safety. This report shows some encouraging signs of this occurring, although areas of concern remain.

Overall perceptions of safety have increased, although a significant difference remains between nursing and administrative staff. Organizational learning is an area in which great strides have been made in narrowing the gap between nursing and administrative staff, as might be expected

if facilities had undertaken interventions to increase their learning culture to make sure that mistakes lead to positive changes. Teamwork within units is perceived positively by both groups.

However, communication openness is an area with a large and increasing gap in the perceptions of nursing and management staff, as is nonpunitive response to error. The disparity in scores in these two areas indicates that management's perception of how it responds in these areas is not shared by frontline nursing staff. The wide and continuing discrepancy in positive scores in the dimension of management support for patient safety may also indicate a need for more intensive interventions in these areas.

There are several possible explanations for the uniform differences in views on patient safety culture between the two groups. One possibility is that the different experiences nursing and administrative staffs have in the hospital, and their tenure within that facility, affected their perceptions of patient safety culture consistently across all dimensions. One might expect, for example, that nurses might have greater knowledge of events that could have resulted in safety incidents or have greater anxiety about staffing shortages than administrators, but it is hard to imagine that these differences would be of nearly the same magnitude across all items of interest by chance.

The simplest explanation is that these nurses had a more pessimistic global view of safety culture in their institutions than administrative staff. That view is buttressed by the large and consistent differences in the global patient safety grade, and the observation that this one item explains, on average, almost 10 percent of the variance in every other item in the survey. Why nurses should have a more pessimistic view of safety culture than management is an area of some conjecture, and the literature for this line of inquiry is sparse. In a study in four Canadian university-affiliated intensive care units (ICUs), managers perceived a more positive safety climate than frontline staff. The authors speculated that this might be due to information about patient safety being more available to management, and also that management might also be more attuned to the identification and resolution of patient safety concerns. It was also noted that this discordance could provide opportunities for discussion of patient safety concerns.[15]

A study conducted in 15 California hospitals using a safety culture survey designed to discover "problematic responses" found a definite discrepancy between the attitudes and experiences of senior managers (particularly nonclinicians) and those of nonmanagers, and that nurses in particular gave more problematic responses than nonclinicians, regardless of management status.[16] The researchers hypothesized that this could imply a tendency for frontline workers to gloss over patient care problems when briefing senior management, and that this in turn could make it difficult for nonclinician executives to understand the true state of their organization.

Comparisons of nurse vs. physician attitudes regarding safety issues are somewhat more prevalent. In an international cross-sectional study comparing error, stress, and teamwork in medicine and aviation, although 77 percent of intensive care doctors reported high levels of teamwork with nurses, only 40 percent of nurses reported high levels of teamwork with doctors.[17] Similarly, in another study, operating room surgeons rated the quality of their collaboration and cooperation with other surgeons "high" or "very high" 85 percent of the time,

but nurses rated their collaboration with surgeons as "high" or "very high" only 48 percent or the time.[18]

On the contrary, nurses had higher scores than physicians for perceptions of safety at The Johns Hopkins Hospital, including fewer physicians (54 percent) than nurses (84 percent) who perceived encouragement from their supervisors to report safety concerns.[19] The author concluded that senior leaders must become more visible to frontline staff in their efforts to improve patient safety. This apparent discrepancy may be a reflection of specific institutional efforts at Johns Hopkins, since the author states, "…most of the efforts to enhance reporting of medication errors have been led by nurses and pharmacists."[19]

Limitations

Although the instrument itself has been validated, respondents to this survey represented a convenience sample and were nonrandomized and nonuniform across hospitals. Nonresponders, including most physicians, may have potentially biased the results. The survey was conducted at different times in different hospitals, both with respect to the community's awareness of patient safety issues and to the hospital's own patient safety efforts, of which the reporting system was but one component.

We were not involved in designing or implementing interventions to improve safety culture in the study hospitals, and so we did not collect data on the safety culture training or interventions provided to the staff. This limitation makes it difficult to evaluate how the training might have influenced the study findings.

We also did not collect any information regarding hospital characteristics or changes in hospital characteristics between measurement periods. We recognize that, during the period of time between the first measurement and the second measurement (3 years), substantial changes in hospital characteristics, such as organizational structure, could pose a threat to the validity of these findings.

Conclusion

Patterns of responses to the AHRQ Hospital Survey on Patient Safety Culture during two measurement periods from a convenience sample of respondents in mostly small, rural hospitals in West Virginia showed a marked and continuing discrepancy in positive responses between administrative/management staff and nursing staff in several dimensions of patient safety culture. In general, nurses rated safety culture less positively than administrative staff in all hospitals, independent of duration of employment, hours worked, or work unit. This discrepancy could indicate a need for more intensive interventions in certain areas of patient safety culture and is certainly an area for future research inquiry.

Additional analyses exploring the differences between administrative/management staff and nursing staff as these manifest in critical access hospitals vs. other rural and vs. urban facilities will be the topic for a future paper.

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