Implementing a patient safety culture survey to identify and target process improvements in academic ambulatory urology practices: a multi-institutional collaborative

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Introduction: *A shared professional culture focused on patient safety is critical to delivering high-quality care. There is a need for objective metrics to help identify target areas for improvement in patient safety culture. The Medical Office Survey on Patient Safety Culture (SOPS) was developed and validated by the United States Agency for Healthcare Research and Quality to measure patient safety culture in the ambulatory setting. In this study we report on safety culture and practices in six academic urology clinics utilizing this validated questionnaire.*

Materials and methods: *The SOPS was administered to all staff in ambulatory urology practices affiliated with participating centers. Percent positive responses were calculated for each of 10 validated composite domains and were compared between sites and respondent roles. Nonparametric statistical analyses were performed to identify differences between groups.*

Results: *The survey was administered to 185 staff members, with an overall response rate of 66%. Within each domain there was substantial variability between sites, with significant differences observed in staff training ($p = 0.034$), office processes/standardization ($p = 0.008$), patient care tracking ($p = 0.047$), communication about errors ($p = 0.001$), and organizational learning ($p = 0.015$). Similar variation was seen between respondent roles with significant differences for patient care tracking ($p = 0.002$) and communication about errors ($p = 0.014$).*

Conclusions: *The SOPS is a clinically useful tool to identify issues impacting a practice's safety culture. Substantial variability was observed within each composite domain at the levels of practice site and respondent role. Comparing composite domain results between clinics will allow leadership to identify gaps and evaluate policies and resources of higher performing peer sites.*

Key Words: patient safety, ambulatory care, healthcare surveys, patient care team

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Introduction

In order to effectively deliver high-quality care, surgical teams must be able to identify and prevent medical errors. Since the United States Institute of Medicine's report To Err is Human in 2000, the medical community has worked to improve the safe delivery of healthcare and reduce preventable errors.[1] Although adverse events can be identified and tracked, the conditions that predispose an organization to such events are often difficult to quantify.[2] One such predisposing condition is a culture of patient safety.[3]

A patient safety culture describes the professional climate of a healthcare team and incorporates its shared set of professional values and behaviors, specifically focusing on practices that can minimize the risk of adverse patient events.[4] This culture is an aggregate of practices such as team communication and the response to errors. A successful culture requires buy-in from all team members.

There is increasing evidence that an organization's baseline safety culture correlates with its incidence of errors.[5] For example, a prior study utilizing the United States Agency for Healthcare Research and Quality (AHRQ) Inpatient Hospital Survey on Patient Safety Culture found that more positive domain composite scores were correlated with a lower reported incidence of adverse events.[6] Initiatives to improve safety culture may lead to a decrease in the frequency of medical errors, and there is at least some evidence that such initiatives could improve clinical outcomes.[7] It should be noted that patient safety culture is a highly local phenomenon which may vary between institutions, practices within the same institution, and geographic regions.[8] While this variation cannot be entirely controlled, it does not preclude learning from the processes of other sites through comparison of existing patient safety cultures. Indeed, comparative evaluations could help teams to develop and implement novel ideas that allow them to better deliver high-quality patient care.

Although work in other specialties has demonstrated the variability in safety culture across units, regions, and even occupations,[9] little is known about safety culture specifically within urology. Furthermore, given the unique nature of a urological practice relative to other medical and surgical specialties, the findings in these practices may not be transferrable. To correct this deficit, we first measured the perceived safety culture across a range of ambulatory urological practices, and then, as an initial step towards learning and improvement, identified how this culture varied between practice site and staff roles with the use of a validated patient safety culture survey. We hypothesized that significant and meaningful differences would be identified between sites (suggesting differences in the strength of their patient safety cultures), and that analysis of responses would identify specific processes that an office could later target for improvement.

Materials and methods

Survey instrument

The AHRQ developed a series of Surveys on Patient Safety culture (SOPS) to assess the perceived patient safety culture in several healthcare settings. The survey tools are publicly available and were designed to measure an organization's perceptions about its own patient safety culture, focusing on related domains.[12] Individual survey questions are aggregated into domains based upon the element of safety culture they address. The domains include communication about error, communication openness, office processes and standardization, organizational learning, overall perceptions of patient safety and quality, owner/managing partner/leadership support for patient safety, patient care tracking/follow up, staff training, teamwork, and work pressure and pace. The survey also includes ungrouped questions addressing specific patient safety and quality issues, information exchange with other healthcare practice settings, and an overall rating of quality and patient safety. All included domains/survey sections have been shown to have good internal consistency as well as external validity.[10] The surveys are proposed for use in assessing culture, developing ideas for initiatives to improve it, and evaluating the impact of such initiatives. Item responses include a 6-point scale with predefined frequencies (such as daily, weekly, monthly, etc.) or a five-point Likert-type scale. For more information on the survey design, item scoring, and domain composition, please see the AHRQ manual.[12] The AHRQ also publishes a Comparative Database Report for reference, which provides a mean response for each composite domain from all practices that voluntarily submitted their results to the AHRQ. At the time of survey administration, the last such Comparative Database included offices responding in 2016.[11]

Survey population

The Medical Office SOPS was administered to six independent office-based urology practices at three academic institutions (University of Pennsylvania, Oregon Health & Science University, and University of Kentucky). Each site had different and unique clinical staff. All staff at each site were surveyed, including physicians, advanced practice providers, nurses, administrative/scheduling staff, office leadership, and all other employees (e.g. in-office laboratory technicians, medical assistants, etc.). Responses were collected at each site over a 4-week period from August 28, 2017 to September 22, 2017. The survey was administered electronically via e-mail, and all responses were anonymous. Each institution administered the survey independently. However, all responses were later centrally aggregated and sites were de-identified for analysis. Sites A, B, and C were from the same health system, site D was from a second health system, and sites E and F were from the same third health system.

Statistical analysis

Response rates were calculated overall and for each site. Percent positive scores were calculated for each unique question of the 10 predefined composite domains. Percent positive scores for each question were defined as a score of 4 or 5 on a positively worded prompt (e.g. "in this office, we treat each other with respect"), or a score of 1 or 2 on a negatively worded prompt (e.g. "we have problems with work flow in this office").

Composite domain scores were compared between office site, respondent professional role, and by predefined work history data (i.e. duration of employment in the office and full- or part-time employment). As a reference, AHRQ-published aggregated scores for all United States urology practices that submitted SOPS data in 2016 (a total of 26 practices with 219 individual responses).[11] Since only aggregate data is available for these practices from AHRQ, statistical analyses were not able to be performed. However, they do provide an available benchmark.

Nonparametric statistical analyses were used to quantitatively compare composite domain percent positive scores between groups. A two-tailed test with $p < 0.05$ was considered statistically significant. A threshold difference of 10 points was defined as meaningfully/clinically significant for semi-qualitative analysis (i.e. a percent positive score of 85% for physicians was significantly higher than a score of 75% for nurses). The AHRQ has not set a threshold value for a meaningfully important difference in scores and encourages practitioners to define a difference they think would be meaningful, but they note that a difference of at least 5 points is likely to be statistically and meaningfully significant in most practices. Statistical analyses were performed using nonparametric techniques on SPSS version 22 (IBM Corporation, Armonk NY, USA).

Results

The survey response rate was 71% (131/185). Nine subjects were excluded for incomplete surveys that precluded analysis, yielding an overall complete response rate of 66% (122/185). The individual site complete response rates were 82% (Site A: 47/57), 58% (Site B: 11/19), 72% (Site C: 16/22), 46% (Site D: 19/44), 69% (Site E: 22/32), and 64% (Site F: 7/11). Captured demographic information on survey respondents is summarized in Table 1.

Overall, the lowest scoring domain was work pressure and pace (28% positive) and the highest scoring domain was teamwork (63%). The overall percent positive score for each domain is depicted in Figure 1. At the office site level, there was substantial variability in percent positive scores for each domain, Table 2. A statistically significant difference was observed between two or more sites in the domains of patient care tracking ($p = 0.047$), organizational learning ($p = 0.015$), staff training ($p = 0.034$), communication about error ($p = 0.001$), and office processes/standardization ($p = 0.008$). Meaningful differences (difference of > 10 points) were also observed between two or more sites in these same domains.

At the level of staff roles, there was also significant variation in percent positive scores, Table 3. Statistically significant differences were identified in the domain of patient care tracking ($p = 0.002$), and a meaningful

TABLE 1. **Demographics of survey respondents**

	n (% of all respondents) includes all sites
Number of respondents/ number surveyed	122/185
Staff position	
Physician	44 (36.1%)
Advanced practice provider (NP, PA)	17 (13.9%)
Management	5 (4.1%)
Administrative/clerical staff	23 (18.9%)
Nursing	14 (11.5%)
Other support staff	18 (14.8%)
Declined to answer	1 (0.8%)
Tenure at office	
< 2 months	5 (4.1%)
2-12 months	15 (12.3%)
1-3 years	32 (26.2%)
3-6 years	26 (21.3%)
6-11 years	22 (18.0%)
11+ years	18 (14.8%)
Missing/declined to answer	4 (3.3%)
Weekly hours worked at office	
1-4	1 (0.8%)
5-16	7 (5.7%)
17-24	6 (4.9%)
25-32	5 (4.1%)
33-40	47 (38.5%)
41+	52 (42.6%)
Missing/declined to answer	4 (3.3%)

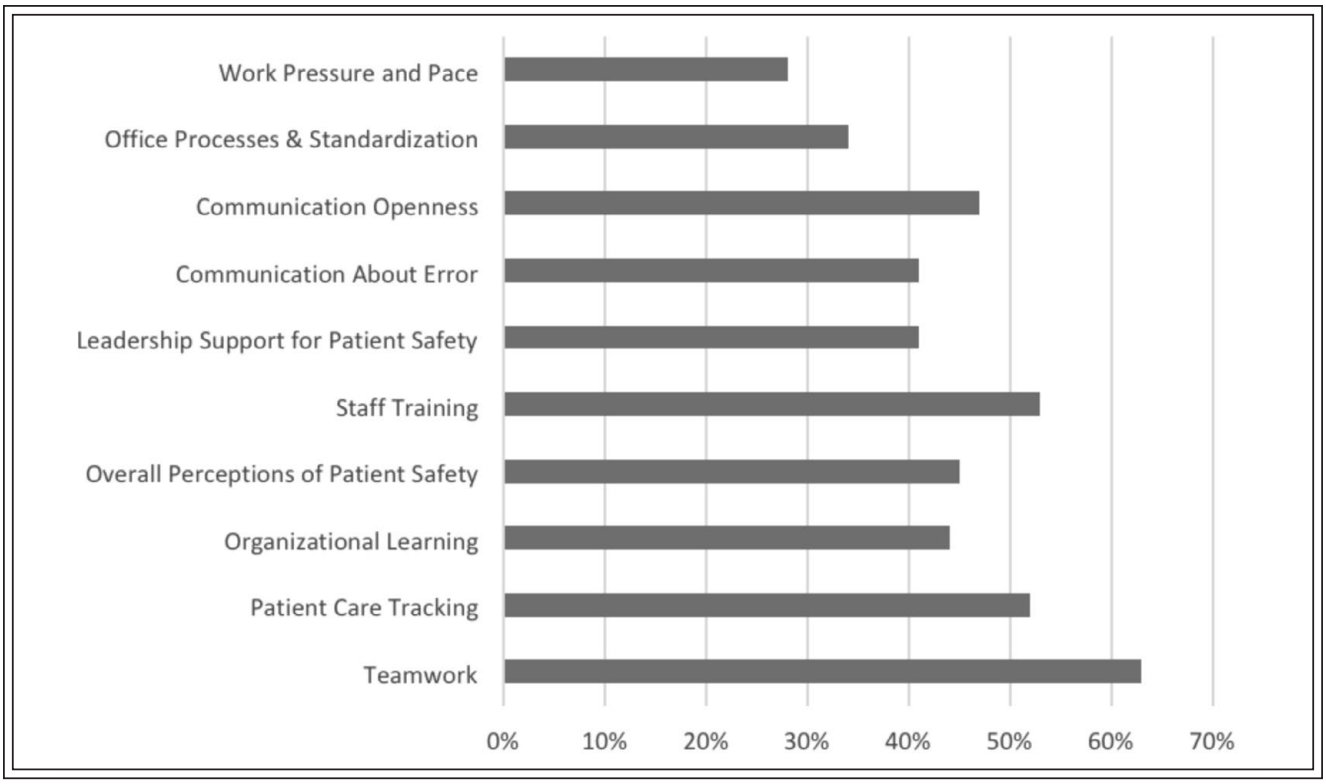

Figure 1. Overall percent positive responses by domain (all sites).

TABLE 2. **Percent positive responses by office site**

Composite domains	**Site A (n = 47)**	**Site B (n = 11)**	**Site C (n = 16)**	**Site D (n = 19)**	**Site E (n = 22)**	**Site F (n = 7)**	**2016 benchmark** (n = 219)**
Teamwork	56%	68%	60%	50%	82%	82%	86%
Patient care tracking	38%*	54%	63%	53%	69%*	57%	90%
Organizational learning	39%	51%	56%	19%*	66%*	52%	78%
Overall perceptions of patient safety & quality	42%	54%	56%	33%	45%	60%	84%
Staff training	63%*	55%	59%	25%*	48%	69%	81%
Leadership support for patient safety	38%	36%	47%	26%	53%	48%	73%
Communication about error	31%*	62%	41%	24%*	57%*	64%	72%
Communication openness	50%	64%	53%	19%	52%	61%	73%
Office processes & standardization	31%	42%	50%*	11%*	37%	54%	71%
Work pressure & pace	32%	18%	29%	24%	22%	43%	56%
Average across composites	42%	50%	51%	28%	53%	59%	76%
Overall rating of patient safety culture	25%	27%	41%	17%	41%	57%	64%

*statistically significant differences at the $p < 0.05$ level
**AHRQ-published aggregate data in 2016

TABLE 3. **Percent positive responses by staff position**

Composite domains	Physician (n = 44)	Advanced practice provider (n = 17)	Management (n = 5)	Clerical staff (n = 23)	Nursing (n = 14)	Other support staff (n = 18)
Teamwork	65%	55%	85%	51%	71%	71%
Patient care tracking	32%*	49%	--†	70%	55%	76%*
Organizational learning	39%	34%	100%	41%	53%	50%
Overall perceptions of patient safety & quality	36%	41%	85%	45%	59%	48%
Staff training	56%	47%	93%	48%	68%	39%
Leadership support for patient safety	32%	35%	--†	34%	54%	59%
Communication about error	42%	32%	75%	28%	38%	58%
Communication openness	54%	42%	58%	36%	55%	46%
Office processes & standardization	25%	23%	60%	38%	52%	35%
Work pressure & pace	29%	22%	25%	29%	34%	28%
Average across composites	41%	38%	73%	42%	54%	51%
Overall rating of patient safety culture	31%	19%	60%	26%	21%	44%

*statistically significant differences at the $p < 0.05$ level
†percent positive scores excluded for domains where < 3 respondents answered domain questions

difference was again observed in this domain. When evaluating percent positive scores based upon tenure at a site and average hours worked per week, there was no difference identified for any domain (all $p > 0.05$).

Discussion

Despite being a detailed questionnaire with over 40 individual prompts, the SOPS is a feasible analysis tool for implementation in a busy urologic practice. We achieved a 66% response rate which is comparable to other large multi-center studies using this instrument.[13] From our application, we identified that perceived patient safety culture can vary markedly between practice sites (both between institutions and within a single institution) and staff roles. However, respondents' perceptions demonstrated no association with their tenure in an office or their weekly work volume.

The variability observed in this study parallels that seen with administration of the Medical Office SOPS and hospital SOPS in other fields.[14,15] Variability is suspected to be attributable to the local effect of collective behavior and values within each work unit or at each institution. This is even evident at the individual level with perceptions of patient safety culture varying between staff roles.[16,17] Although this variability between sites and roles is expected, it is these differences that represent promising candidate domains for collaborative process improvement in future initiatives.

The participating institutions scored below AHRQ aggregate benchmarks in almost all domains. It is unclear what underlies this difference, but as the AHRQ benchmark data was limited to only 26 self-reported practices, there is likely some element of a reporting bias towards higher performing sites in the AHRQ database. Our results showed consistently low scores for the domain of work pressure and pace. It is notable that this domain is also the lowest scoring across the majority of medical specialties and practice settings in the AHRQ's aggregate data.[11] This suggests a broader perception of potentially detrimental work/time pressure that may not actually be unique to urology, but to the practice of medicine in general, which is concerning. In our survey, respondents in management/leadership roles tended to report more positive perceptions of safety culture across most domains, again consistent with findings in other medical specialties.[18]

The domains captured within the SOPS and the publication of national benchmark data allow sites to compare their results to reported outcomes to identify specific risks to patient safety. Once highlighted, this allows staff and office leaders to allocate resources, improve upon existing processes, and develop new practices to minimize potential errors and improve the overall reliability of care delivered.

This report provides a baseline measure of perceived patient safety culture at our institutions, and thus, represents only the first step in a concerted effort to improve the safety and quality of care delivered. The next step will be to form a patient safety collaborative across our institutions to learn about what supports our individual sites' safety practices. We can then leverage and replicate these processes at underperforming peer sites within the collaborative. This collaborative model has demonstrated to be successful in other medical specialties.[19]

There are several important limitations to this study. The 66% overall response rate is consistent with acceptable survey study response rates, but there is still the potential for response bias. We do not have information regarding the perceptions of non-responders, and at the site level, the response rates were lower, particularly for Site D (46%). Respondents may have also had recall bias, answering questions based upon recent individual experiences rather than long term perceptions of the worksite's culture. We also do not know how perceived patient safety culture impacts other measures of safety, such as adverse event reporting or the rate of medical errors. We intend to study these correlations in subsequent investigations as part of our on-going patient safety collaborative. Finally, we have no measure of how patient safety culture impacts patient outcomes, such as readmissions. Again, this will be tested in future research.

Conclusions

The SOPS is a feasible and useful tool to evaluate the perceived culture of patient safety among staff in the urological practice. However, substantial variability does exist within each composite domain at the levels of practice site and respondent role. This is consistent with findings in other medical specialties. Comparing composite domain results between clinics will allow leadership to identify gaps and evaluate policies and resources of higher performing peer sites for later learning, dissemination, and replication. □

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