Perceptions of Patient Safety Culture among Physicians and Nurses in a Tertiary Hospital in Southwestern Saudi Arabia

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Abstract

Background: Patient safety has been one of the basic tenets of medicine and healthcare since the time of Hippocrates. The data regarding patient safety awareness among health care workers in southwestern Saudi Arabia is scarce.

Aim: To explore physicians and nurses' overall attitudes and perceptions towards patient safety culture and to evaluate any differences in their cultures.

Methodology: This cross-sectional study of a representative sample of physicians and nurses working in a tertiary hospital was conducted using a self-administered questionnaire developed by the Agency for Healthcare Research and Quality.

Results: The study included 369 participants. Their ages ranged from 18 to 60 years, with a mean age of 28.9 ± 8.5 years. The majority of participants were females (70.7%). The mean score for the overall patient safety grade was 72.3. The highest rated patient safety dimensions (scores over 70%) were "teamwork within units", "organizational learning-continuous improvement" and "feedback and communication about errors". On the other hand, the lowest dimensions (scores less than 50%) were "non-punitive responses to errors" and "Staffing". A statistically significant difference between physicians and nurses were found in 8 dimensions out of 12 dimensions of patient safety culture. The overall scores of the unit-level safety culture were significantly higher among nurses than among physicians (65.9% and 63.6%, respectively, P=0.022). Similarly, in the hospital-level safety culture, nurses had significantly higher safety culture scores than physicians (68.1% and 58.4%, respectively, P=0.001).

Conclusions: Nurses and physicians scored patient safety differently. Their perceptions regarding "teamwork within units", "organizational learning-continuous improvement" and "feedback and communication" were good. However, other patient safety dimensions need to be improved. Overall, nurses' perceptions are significantly better than physicians' perceptions. To improve healthcare delivery in the region, capacity-building programs should focus on improving the patient safety culture among health care providers, in general and with physicians in particular. Further studies are recommended among healthcare workers at other levels of healthcare in the region in order to improve patient safety practices.

Key words: Patient safety culture; Physicians; Nurses; Saudi Arabia

Background

Health-related behaviour in early life influences later risks for lifestyle-related disorders. It is therefore important to investigate health behaviors among young people. University students represent a major segment of the young adult population health-related behavior in early life influences later risks for lifestyle-related disorders. It is therefore important to investigate health behaviors among young people. University students represent a major segment of the young adult population.

World Health Organization (WHO) defines patient safety "as the absence of preventable harm to a patient during the process of health care" (1). Patient safety culture is one of the components of the healthcare organization's culture which consists of shared values, attitudes, norms and pattern of behavior of employees regarding safety (2). Patient safety culture is enabled by different factors such as transparency of communication, leading by example, a commitment to continuous improvement, psychological safety which facilitates reporting of errors, and engagement of both patients and their families (3). An improved patient safety culture has been associated with reduced patient harm, perception of better care by patients (5) and family members (6), and reduced staff burnout (4-7). Researchers from Johns Hopkins University analyzed medical death rate data for a period of 8 years and found that deaths due to medical errors had increased to over 250,000 per year in the USA (8). A national survey from Saudi Arabia reported that the majority (70%) of the hospitals did not have a medication safety committee and only 9% had a medication safety officer(9). Two studies in Saudi Arabia estimated the prevalence of prescribing errors, in two governmental hospitals, to range between 13 and 56 per 100 medication orders (10-11).

It has been understood that medical errors can be due to systems failure and have become one of the most significant challenges for optimum healthcare provision. Patient safety can be improved by detecting inappropriate events that occur, learning from those events, and working toward preventing them (12). A recent study conducted in Saudi Arabia suggests building a program for transformational interference to promote patient safety culture (13). A study conducted in a medical city in Riyadh reported that regular assessment of hospitals helps to assess the changes in their performance and identify further areas of improvement (14).

There are many gaps in the knowledge of safety attitudes of health professionals among hospitals in Saudi Arabia and the data regarding patient safety awareness among health care workers in southwestern Saudi Arabia are scarce. Therefore, this study was undertaken with the purpose of exploring physicians and nurses' overall attitudes towards patient safety culture in a tertiary health care hospital in southwestern Saudi Arabia.

Methodology

This cross-sectional study addressed awareness among physicians and nurses working at a tertiary hospital which is located in the southwestern part of the Kingdom of Saudi Arabia during the period from 2017 to 2019.

The study used the validated version of the "Surveys on Patient Safety Culture" (SOPS)(15), which is a self-administered questionnaire developed by the Agency for Healthcare Research and Quality (AHRQ). The SOPS was developed to evaluate the culture of patient safety in a healthcare facility. It contains 42 items and measures 14 dimensions. These 14 dimensions were organizational learning-continuous improvement, teamwork within units, hospital management support for patient safety, feedback and communication about errors, teamwork across hospital units, supervisor/manager expectations and actions promoting patient safety, frequency of events reported, overall perception of patient safety, hospital handoffs and transitions, communication openness, staffing, and non-punitive responses to errors. This tool has been previously used in many studies conducted worldwide, including Saudi Arabia 16-19. Permission for use of the tool was obtained from AHRQ. Ethical approval was obtained from the regional research ethics committee with REC # 2017-05-14. Informed consent was obtained from all the participants.

The target population was all physicians and nurses who were working at the tertiary hospital for at least six months, to ensure that they were familiar with the general running and administrative systems of the hospital.

For the scoring system used, the items' positive score percent for each dimension (safety culture) were summed together, and the composite mean of positive percent scores for each dimension and total score were calculated; the composite positive score percent ranged from zero to 100% for all dimensions. Positive score percent was considered for the agreement answers in positive word items (positive statements) and for disagreement for negative word items (negative statements).

A minimal sample size of 360 medical staff (nurses and physicians) was calculated assuming that the average perception rate for patient safety culture was 50% with a 7% margin of error at the 95% confidence level with a design effect of 2. A stratified two-stage sampling method was used as the job title (physicians versus nurses). At the first stage, each member of the hospital department staff was stratified according to job title. At the second stage, a random sample from each stratum was included in the study using the proportional allocation technique. The questionnaires were distributed by hand.

Descriptive statistics included the mean with standard deviation for the composite positive score's percentage of different dimensions and frequency and percent to describe the frequency of each category for categorical variables. Independent t-tests were used to test for differences

in the mean score percentage of different dimensions of safety and outcomes between the different health care facilities. Correlation analysis was used to test the nature and strength of the relation between safety culture dimensions and outcomes. All statistical analyses were performed using two-tailed tests, and an alpha error of 0.05. P values less than or equal to 0.05 were considered statistically significant. One-way ANOVA and independent t-test were used to test for differences at mean score % of different dimensions of safety and outcomes between the different professions. Chi square / Monte Carlo exact test and Fishers exact test were used to test for the differences at the health care staff characteristics between the different professions. Exact tests were used if there were small frequencies where chi square was invalid. Correlation was used to test the nature and strength of relation between safety culture dimensions and outcomes. The Pearson correlation coefficient (r) is expressed as the sign of the coefficient and indicates the nature of relation (positive / negative) while the value indicates the strength of relation.

Results

The study included 369 participants. Their ages ranged from 18 to 60 years, with a mean age of 28.9 ± 8.5 years. The study included 32.5% physicians, and the rest were nurses. The majority (70.7%) of the study participants were females. A higher proportion (45.5%) of the staff had working experience in the facility for 1-5 years, and 79.7% had worked for 40 hours or more weekly. A total of 74.6% of the sample had received training for safety measures. Arabic was the native language among 43.2% of the participants. (Table 1)

Most (7 out of 12) of the patient safety culture dimensions were significantly higher among nurses as compared to physicians. With regard to the unit level of safety culture, the following dimensions were significantly higher among nurses as compared to physicians: “organizational learning-continuous improvement’, “communication openness”, “feedback and communication about errors”, and “non-punitive responses to errors”. The overall unit-level safety culture score was significantly higher among nurses than among physicians (P=0.022). The highest rated dimensions (scores over 70%) were “organizational learning-continuous improvement”, “teamwork within units”, and “feedback and communication about errors”. On the other hand, the less rated dimensions (60 - 70%) were “communication openness” and “supervisor expectations and actions promoting patient safety”. The lowest rated dimensions (<60%) were “Staffing” and “non-punitive responses to errors”. (Table 2)

The hospital-level safety culture dimensions were found significantly higher among nurses than physicians. The overall hospital-level safety culture score was significantly higher among nurses than among physicians (P=0.001). Regarding outcome assessment, only the frequency of events dimension was significantly higher among nurses than among physicians (73.6% vs 62.7%, respectively; P=0.001). (Table 2)

Regarding unit-level safety culture, all patient safety culture dimensions showed significant correlations with the following outcomes: overall perceptions of patient safety except for “staffing”, with frequency of events reported except “non-punitive responses to errors” and with patient safety guide. The correlation coefficients ranged from -0.05 to 0.47. For hospital-level safety culture items, all items showed significant positive correlations with different outcome indicators except for handoffs and transitions. The correlation coefficients ranged from 0.04 to 0.44. (Table 3)

Table 1: Participant characteristics. N=369

Personal data		No	%
Gender	Male	108	29.3%
	Female	261	70.7%
Age	18-29	170	46.1%
	30-39	131	35.5%
	40-49	43	11.7%
	50-60	25	6.8%
Nationality	Saudi	162	43.9%
	Non-Saudi	207	56.1%
Position	Attending/Staff Physician	28	7.6%
	Resident or Specialist Physician	71	19.2%
	Consultant Physician	21	5.7%
	Nurse Aid or Practical Nurse	44	11.9%
	Registered Nurse	205	55.6%
Experience in facility	Less than 1 year	66	17.9%
	1-5	168	45.5%
	6-10	95	25.7%
	11 or above	40	10.8%
Experience in unit	Less than 1 year	82	22.2%
	1-5	190	51.5%
	6-10	67	18.2%
	11 or above	30	8.1%
Working hours per week	< 20 hours	25	6.8%
	20-40	50	13.5%
	41-60	250	68.1%
	60+	43	11.6%
Interaction with patients	Yes	350	94.9%
	No	19	5.1%
Experience	Less than 1 year	42	11.4%
	1-5	161	43.8%
	6-10	104	28.3%
	11 or above +	62	16.6%
Training	Yes	276	74.6%
	No	93	25.4%
Language	English	209	56.8%
	Arabic	160	43.2%

Table 2: Description of unit-level and hospital level safety culture dimensions with the outcome according to the healthcare professions. N=369

Domain	Dimensions	Overall		Profession				P
				Physician		Nurse		
		Mean%	SD	Mean%	SD%	Mean%	SD	
Unit-level safety culture	Supervisor/Manager Expectations and Actions Promoting Patient Safety	63.7	14.5	65.1	15.6	63	13.9	0.182
	Organizational Learning-Continuous Improvement	76.1	15.1	70.5	13.2	79	15.3	0.001*
	Teamwork Within Units	75.8	15.8	75.9	13.8	75.8	16.8	0.944
	Communication Openness	64.8	15.2	62.7	14	65.9	15.8	0.046*
	Feedback and Communication About Errors	71.1	17.9	63.7	16.8	74.8	17.4	0.001*
	Non-punitive Responses to Errors	51.2	15.8	49.4	15	52.1	16.1	0.116
	Staffing	54	11.1	56.1	11.2	53	10.9	0.011*
	Unit-Level Safety Culture	65.2	9.1	63.6	8.6	65.9	9.3	0.022*
Hospital-level safety culture	Management Support for Patient Safety	70.7	15.3	63.9	16.5	74.1	13.4	0.001*
	Teamwork Across Units	65	14	56.9	13.7	69.1	12.3	0.001*
	Handoffs and Transitions	60.4	16	55.8	15	62.7	16.1	0.001*
	Hospital-Level Safety Culture	64.9	12.5	58.4	11.7	68.1	11.6	0.001*
Outcome	Perceptions of Patient Safety	66.7	12.1	67.2	12.9	66.5	11.7	0.637
	Frequency of Events Reported	69.9	19.7	62.7	20.6	73.6	18.1	0.001*
	Patient Safety Grade	72.3	17	72.9	15.8	72	17.7	0.643

* $P < 0.05$ (Significant)

Table 3: Correlation between patient safety and outcome dimensions. N=369

Factor	Patient safety culture dimensions	Correlation coefficient	Outcome		
			Overall Perceptions of Patient Safety	Frequency of Events Reported	Patient Safety Grade
Unit-level safety culture	Supervisor/Manager Expectations and Actions Promoting Patient Safety	r	0.32	0.21	0.36
		P	.001*	.001*	.001*
	Organizational Learning-Continuous Improvement	r	0.27	0.40	0.34
		P	.001*	.001*	.001*
	Teamwork Within Units	r	0.32	0.29	0.34
		P	.001*	.001*	.001*
	Communication Openness	r	0.11	0.30	0.16
		P	.001*	.001*	.001*
	Feedback and Communication About Errors	r	0.32	0.47	0.39
		P	.001*	.001*	.001*
	Non-punitive Responses to Errors	r	0.15	-0.05	0.11
		P	.001*	.372	.005*
	Staffing	r	0.05	0.12	0.11
		P	.162	.001*	.002*
Hospital-level safety culture	Management Support for Patient Safety	r	0.44	0.24	0.39
		P	.001*	.001*	.001*
	Teamwork Across Units	r	0.30	0.18	0.29
		P	.001*	.001*	.001*
	Handoffs and Transitions	r	0.34	0.04	0.25
		P	.001*	.309	.001*

Discussion

In the present study, the overall mean percentage scores for the seven unit-level safety culture dimensions ranged from 51.2% for “non-punitive responses to errors” to 76.1% for “organizational learning-continuous improvement”. The highest rated dimensions (scores over 70%) were “organizational learning-continuous improvement”, “teamwork within units” and “feedback and communication about errors”. These results are consistent with those in Riyadh, Saudi Arabia, (20) and in Kuwait (21). This finding shows that most physicians and nurses ‘agreed’ or ‘strongly agreed’ that people supported one another within the unit during times of urgent and high workloads and treated each other with respect. Most participants also ‘agreed’ or ‘strongly agreed’ that their organization was actively functioning towards ensuring patient safety and continuously evaluating and improving the effectiveness of their patient safety standards. Furthermore, most participants also ‘agreed’ or ‘strongly agreed’ that they had an efficient system of feedback and communication about errors and that they took steps to prevent the repetition of errors to ensure patient safety. A systematic review on studies from the Arab states regarding Hospital Survey on Patient Safety Culture by Elmontsri et al concluded that overall teamwork within units was better than teamwork across hospital units. Organizational learning and continuous improvement were found to be satisfactory, the average score of this dimension was 73.2% (22). Staffing, non-punitive response to errors, organizational learning improvement, feedback about the error, and teamwork were also identified as the areas of strength in another study in Arar city, Saudi Arabia (23).

The lesser rated dimensions included “communication openness” and “supervisor expectations and actions promoting patient safety”, and the lowest rated dimensions were “staffing” and “non-punitive responses to errors”. For the latter two dimensions, scores were 54.6% and 50.8%, respectively, suggesting that only half of the participants ‘agreed’ or ‘strongly agreed’ with the positive items. These findings are consistent with those of the researchers who studied hospitals in Makkah, Saudi Arabia,(24) who also found that “staffing” and “non-punitive responses to errors” were two dimensions that needed improvement in Saudi hospitals. Moreover, the review by Elmontsri et al also concluded that communication openness was a concerning issue for healthcare professionals in the Arab world (25). Communication openness was identified as

the area for improvement by other studies conducted in Saudi Arabia (17 20, 25).

When the three hospital-level safety culture dimensions were considered, the scores were highest for "management support for patient safety", followed by "teamwork across units", and "handoffs and transitions". Most participants 'agreed' or 'strongly agreed' that hospital management was interested in promoting a climate of patient safety and that this was a top priority for the organization. Furthermore, most participants 'disagreed' that their management was interested in patient safety only after an event had occurred. Most participants also perceived that there was good cooperation and coordination among hospital units with the goal of providing the best possible patient care. Finally, most participants also felt that "handoffs and transitions" occurred quite smoothly without compromising patient safety. Similar results were reported in Riyadh, Saudi Arabia (20). On the contrary, in another study conducted among nurses in Saudi Arabia, six areas of patient safety were identified as weaknesses, namely "overall perception of patient safety", "handoffs and transitions", "communication openness", "staffing", "frequency of events reported", and "non-punitive response to errors" (26).

Participants also had high positive scores for patient safety outcomes (patient safety grade, frequency of events reported, and overall perceptions of patient safety). These results are consistent with those of a previous study wherein overall patient safety grade for the hospital was considered as an outcome variable (12). On the contrary, another study from Saudi Arabia by Alzahrani et al observed that safety attitudes of doctors and nurses working in emergency departments are less than positive and correlate with the number of reported errors (27).

For the present study, a significant correlation existed between the unit- and hospital-level patient safety dimensions of the SOPS and its outcomes. The results of the present study suggest that the overall perception of patient safety is predicted by nine out of the ten patient safety culture dimensions (except "staffing"). Furthermore, the frequency of events reported is significantly associated with all dimensions except "transitions and handoffs" and non-punitive responses to errors. Finally, patient safety grade is associated with all dimensions significantly. Management support for patient safety improves the patient safety culture (23,28). The hospital leaders should evaluate employees' perceptions and feelings through interviews, discussions and surveys. Such evaluations will guide changes to policies and resource allocation which may improve managers' support for patient safety (29).
The study population included only physicians and nurses. Including other healthcare professionals such as health managers, pharmacists and other members of the healthcare community could have improved study generalizability. Larger samples and using other recruitment strategies should be considered in future safety culture studies in the region. In addition, the findings of this hospital-based study can only be seen as an indication about patient safety culture in such settings. However, the results of this study do provide insights for secondary care practices which can be applied following further studies on this topic.

Conclusions and Recommendations

The study indicated that nurses and physicians' perceptions regarding "teamwork within units" and "organizational learning-continuous improvement" were good in their healthcare facility, but other dimensions such as "communication openness", "supervisor expectations promoting patient safety", "staffing", and "non-punitive responses to errors" should be improved. Overall, nurses' perceptions were significantly better than physicians' perceptions. To improve health care delivery in the region, capacity-building programs should stress improving patient's safety cultures among health care providers in general and physicians in particular. Further studies are recommended among health care workers in the region at other levels of health care, including primary and secondary levels, to evaluate safety culture among them.

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