What Do We Know About Patient Safety Culture in Saudi Arabia? A Descriptive Study

Yasser A. Alaska, MBBS*† and Rabab B. Alkutbe, PhD*

Background: Patient safety is described as the prevention and mitigation of medical errors that can result in harm while a patient is receiving care. One important way to improve safety is through improving the patient safety culture in healthcare. The purposes of this study are to evaluate the patient safety culture trend in Saudi Arabia and assess the improvement over time.

Methods: This study is a descriptive study that used a retrospective analysis of a national data set for 3 cycles from 2019 to 2022. To generate a baseline and allow comparison of the hospital's survey results with the aggregated findings from the database, the 10th, 25th, 50th, 75th, and 90th percentiles were calculated to set the percentage of values.

Result: Our results found that one of the barriers to developing a strong patient safety culture in Saudi Arabia is management support of patient safety, which caused a blame culture. This could explain the absence of improvement in the average percentage of reporting patient safety events for all 3 cycles. On the other hand, a decrease was observed in organizational learning/continuous improvement as well as a reduction in the positive percentage of patient safety ratings in the last cycle. Moreover, areas of strength in all 3 cycles did not reach the 75th percentile, whereas staffing and response to error domains remained the lowest-scoring composites in all cycles.

Conclusion: Our results have determined the percentile of the positive rate that could guide hospitals to improve their culture survey results. More investigations can focus on change over the years in both patient safety culture and the effectiveness of implementing interventions to measure the impact on quality of care.

Key Words: safety culture; patient safety, trending, percentile

The patient safety concept is defined as preventing and reducing medical errors that could cause harm during the care journey.[1] Patient safety is one of the crucial determinants and fundamental contributors to providing high-quality care.[2,3] A report by the World Health Organization has raised global patient safety concerns, where 42.7 million adverse preventable events were annually reported worldwide.[4] The harms resulting from preventable incidents threaten the level of safety and cause physical and psychological damage. Hence, interchangeably patient safety efforts at all levels should be focused on maintaining quality and safety in healthcare. Patient safety culture is one of the significant directions of enhancing safety. Efforts focused on identifying the impact of safety culture and its association with enhancing healthcare outcomes; accordingly, studies have shown a positive association between improving patient safety culture and reducing the number of adverse events reported in a healthcare organization[5,6]

From the *Technical Affair, Saudi Patient Safety Center (SPSC); and †Emergency Medicine, College of Medicine, King Saud University, Riyadh, Saudi Arabia.
Correspondence: Rabab Alkutbe, PhD, Saudi Patient Safety Center (SPSC), 9321 Wadi Al Hayah, Al Muruj, Riyadh 12264, Saudi Arabia (e-mail: dr.rabab.alkutbe@hotmail.com).
The authors disclose no conflict of interest.

The safety culture is linked to various healthcare outcomes such as patient satisfaction, medication error, and the willingness to report events at multiple levels. The culture is formed by individual and group values, attitudes, perceptions, competencies, and patterns of behavior that determine the commitment to an organization's health and safety management.[7]

It has been evident that improving a blame-free environment for reporting and enhancing collaboration across the organization is directly affected by the strong safety culture on patient safety.[8–10]

Many factors can lead to a lack of communication, which has an impact on patient safety. Moreover, the blame culture and poor communication have been proven to be the most common factors contributing to poor patient safety culture in Arab countries.[11] A study conducted in Saudi Arabia concluded that having a diverse workforce, cultural differences, and language barriers are major contributors to the lack of communication.[12] Moreover, fear of blame was mentioned as one of the main obstacles to reporting incidents among nurses in Saudi Arabia.[12]

Sentinel events data reported by the Saudi Ministry of Health (MoH) from 2012 to 2015 were analyzed and showed that 91% were classified as preventable events.[13] In response to this issue, Saudi Arabia initiated approaches to reduce and identify ways of improving the safety and quality of health care.[14] Multiple initiatives have been implemented in Saudi Arabia aiming to measure the patient safety culture to target the area that needs improvement.[14] The Saudi Patient Safety Center (SPSC) is one of the MoH initiatives to develop healthier care at the national level. One of the strategic goals is collecting and analyzing data to propose national legislation related to patient safety and improve the patient safety culture. The SPSC established a culture measurement project to quantify the culture of healthcare organizations within Saudi Arabia and identify priority areas to improve patient safety. The Agency for Healthcare Research and Quality (AHRQ) developed a diagnostic tool to assess hospital patient safety culture in July 2017, SPSC piloted the survey and then conducted the following 3 cycles: cycle 2 (2019), cycle 3 (2021), and cycle 4 (2022).[15] This survey examines the patient safety culture of an organization from the perspective of hospital staff, including frontline clinical and nonclinical staff, pharmacy and laboratory personnel, hospital-employed physicians, hospital supervisors, managers, and administrators.

The project allows hospitals to establish baseline data with future reassessments facilitating measurement of changes in safety culture over time. Accordingly, a retrospective assessment is needed to evaluate the extent to which patient safety culture is a strategic priority and supports patient safety. Therefore, this study aimed to assess the patient safety culture trend in Saudi Arabia and indicate the extent to which safety changed over time. The ultimate objectives are to predict the factors contributing to the patient safety culture, identify improvement opportunities, and establish the positive response percentile for assessing future improvement efforts.

METHODS

This study is a retrospective analysis of the patient safety culture from a national database at the SPSC reported by the hospitals

during a 4-year period from 2019 until 2022. In 2020, the data collection was suspended because of the urgency of the pandemic. The data were collected based on voluntarily submitted survey data from Saudi hospitals, and the consent form was obtained before the survey. It includes 358,313 healthcare provider and staff respondents who administered the survey using versions 1.0 and 2.0 between 2019 and 2022.

Participants

Governmental and private hospitals in Saudi Arabia, including military, academic, specialist, and MoH hospitals, were included. Participants were from different hospitals from all regions with different bed capacities, staff positions, levels of experience, and work areas.

The Patient Safety Culture Survey

The tool used to collect data was developed by the AHRQ[16] to assess the patient safety culture.[17] The Hospital Survey on Patient Safety Culture questionnaire has 2 versions (1.0 and 2.0) and dual-language versions (Arabic and English). Version 1.0 was piloted in 2018 and used in cycle 2 (2019) and cycle 3 (2021). Version 2.0 was translated and approved by the AHRQ and used in cycle 4 (2022). V1.0 consists of 42 items measuring 12 patient safety culture composites, whereas V2.0 consists of 32 items measuring 10 patient safety culture composites (Table 1). The items survey in both versions was a 5-point Likert scale of agreement (1 = "strongly disagree" to 5 = "strongly agree") or a scale of frequency (1 = "never" to 5 = "always"); however, in V2.0, the (Don't apply) was added.

The SPSC established an electronic web-based survey platform and central repositories for survey data to lead and supervise the data collection and distribution. [18] Each hospital's authorized point of contact (POC) was required to register an account on the SPSC's platform. All required information, such as the number of beds, and staff per department and facility, was entered by the POC. The SPSC team and hospitals were able to monitor the progress of data collection in real time and ensure anonymous participation and confidentiality. When each data collection cycle closed, the exclusion criteria recommended by the AHRQ were applied: nonverified registration, noncompleted registration, and hospitals with less than 10 completed surveys.

Regarding combining data from all cycles, although 2 versions (V1.0 and V2.0) were used, the relevancy of each item in each domain was revised and considered. Both survey versions have similar measuring items and are validated to measure patent safety culture. Some of the domain's names were modified in V2.0; however, the concept of the subitems was slightly similar. All cycles were conducted in hospitals from different regions of Saudi. Accordingly, some domains were combined after revising the items, such as domain 1 in V2.0 (Teamwork) and 2 domains from V1.0 (Teamwork within units and Teamwork across units).

Statistical Analysis

IBM Statistical Package for the Social Sciences (SPSS), version 26.0 (Chicago, IL) for Windows, was used for the analysis, of descriptive statistics, including frequencies and percentages. The score of positive responses calculated responses percentage (agree/strongly agree), (always/most of the time), and negatively worded questions (disagree/strongly disagree) were considered in the calculation. Mean, median, and standard deviation (SD) were calculated for each item.

Analysis of variance statistical analysis was performed to demonstrate the differences between cycles and characteristics for the positive mean response by each domain. To generate a baseline and allow comparison of the hospital's survey results with the aggregated findings from the database, the 10th, 25th, 50th, 75th, and 90th percentiles for both versions' cycles were calculated to set the percentage of values. The general assumption was used where values within the 90 intervals from the lower limit 10th to the upper limit percentile are included in the range.[19] The significance level was set at $P < 0.05$, and Tukey post hoc analysis was performed for the difference between groups.

RESULTS

In total, 358,313 surveys were used from 1008 hospitals representing the 3 cycles from all the regions of Saudi Arabia (Table 2). The characteristics of respondents in all cycles showed in (Table 2); nurses had the highest response rate, 46.2%, 32.3% were registered nurses, and 13.9% were either nurse practitioners, technicians, nurse educators, or midwives. Followed by physicians or consultants at 10.96%, respiratory therapists had the lowest response rate at 1.09%.

With regard to the work area, 8.27% of the respondents were from the emergency department, and 7.12 were from the intensive care units. Moreover, the highest response rate according to the experience was participants who had 1 to 5 years at 51.79%, and the majority worked 40 hours or more per week at 81.23%.

Table 3 shows the mean positive percent for all domains among the 3 cycles. However, there was no significant difference in the domain that focused on Management support for patient safety among the 3 cycles with respect to the different versions of the survey, indicating no improvement in the management domain across 3 years.

Although there was a slight increase in the average positive response, no significant difference between C2 and C3 in teamwork across units, teamwork within units, and the overall perceptions of patient safety domains were found.

Notably, no significant difference was observed in the positive response for reporting events among the 3 cycles (Fig. 1). Concerning

TABLE 1. Domain in Versions (1.0 and 2.0) Hospital Surveys on Patient Safety Composite Measures*

	HSOPS 1.0	HSOPS 2.0
D1	Teamwork within units	Teamwork
D2	Staffing	Staffing and work pace
D3	Organizational learning—continuous improvement	Organizational learning—continuous improvement
D4	Nonpunitive response to error	Response to error
D5	Supervisor/manager expectations and actions promoting patient safety	Supervisor, manager, or clinical leader support for patient safety
D6	Feedback and communication about error	Communication about error
D7	Communication openness	Communication openness
D8	Frequency of events reported	Reporting patient safety events
D9	Management support for patient safety	Hospital management support for patient safety
D10	Handoffs and transitions	Handoffs and information exchange
D11	Teamwork across units	—
D12	Overall perceptions of patient safety	—

*Domains included in HSOPS 1.0 and 2.0 adopted from the Agency for Healthcare Research and Quality.

TABLE 2. Respondent Characteristics

	2019	2021	2022	Total	
Hospital	**250**	**366**	**392**	**1008**	
Total Respondents	**77,732**	**134,924**	**145,657**	**358,313**	**Percentage**
Staff position					
Attending/staff physician/consultant	7349	14,397	17,553	39,299	10.96
Registered nurse	29,193	46,708	39,839	115,740	32.30
Nurse practitioner/technician/nurse educator/midwife	7100	13,755	28,961	49,816	13.90
Technician (e.g., EKG, laboratory, radiology)/paramedics	5251	9,950	11,069	26,270	7.33
Resident physician/physician in training/student/trainee	4008	10,325	10,354	24,687	6.88
Pharmacist/pharmacy technician	3464	6527	5529	15,520	4.33
Duty charge/supervisor/manager/director/senior leader/ executive/quality/risk management/infection control	4836	6286	9057	20,179	5.63
Physical, occupational, or speech therapist/psychologist/social worker	1396	2533	5129	9058	2.53
Physician assistant (nonphysician)/healthcare assistant	877	2134	1344	4355	1.21
Dietician	983	1940	1577	4500	1.25
Patient care asst/hospital aide/care partner	882	1847	1884	4613	1.28
Unit assistant/clerk/secretary	704	1613	4197	6514	1.81
Respiratory therapist	735	1491	1708	3934	1.09
Others*	10,954	15,418	7456	33,828	9.44
Work area					
Other/s	24,995	24,089	13,857	62,941	17.56
Surgery	6682	8264	7252	22,198	6.19
Intensive care unit (any type)	6419	11,487	7606	25,512	7.12
Emergency department	5378	11,910	12,368	29,656	8.27
Medicine (nonsurgical)	5083	7484	7398	19,965	5.57
Many different hospitals units/no specific unit	4599	6337	9908	20,844	5.81
Pediatrics	4359	6595	9494	20,448	5.70
Obstetrics	4327	7444	7872	19,643	5.48
Pharmacy	3846	6432	4243	14,521	4.05
Laboratory	3627	7510	6568	17,705	4.94
Radiology	3076	5946	5594	14,616	4.07
Rehabilitation	2206	1765	3330	7301	2.03
Psychiatry/mental health	1692	2552	1503	5747	1.60
Anesthesiology	1443	2172	1816	5431	1.51
OPD	NA	8140	8975	17,115	4.77
Different work areas†	NA	27,530	37,873	65,403	18.25
Tenure in the work area					
<1 y	13,478	18,721	23,027	55,226	15.41
1–5 y	55,529	63,615	66,438	185,582	51.79
6–10 y	34,140	30,818	34,194	99,152	27.67
≥11 y	31,777	21,770	21,998	75,545	21.08
Tenure in the hospital					
<1 y	5394	13,478	17,861	36,733	10.25
1–5 y	25,237	55,529	58,232	138,998	38.79
6–10 y	23,884	34,140	37,749	95,773	26.73
≥11 y	23,217	31,777	31,815	86,809	24.23
Hours worked per week					
<20	1448	2692	NA	4140	1.15
20–39	6594	11,455	NA	18,049	5.04
<30	NA	NA	4485	4485	1.25
30–40	NA	NA	40,588	40,588	11.33
>40	69,690	120,777	100,584	291,051	81.23

*Related to work areas not included within the survey stand.

†Different work areas as the V1.0 was updated.

EKG, electrocardiogram; NA, not available; OPD, outpatient department.

TABLE 3. Composite Measure Results Average Percent Positive Response

Domains	2019	2021	2022*	*P*
D1: Teamwork	69.71†	70.28‡	79.86†‡	<0.000
D2: Staffing, staffing and work pace	31.73†	31.9‡	46.86†‡	<0.000
D3: Organizational learning—continuous improvement	79.73†	80.54‡	76.26†‡	<0.000
D4: Response to error	24.98†	26.19‡	55.61†‡	<0.000
D5: Supervisor/manager expectations and actions promoting patient safety	63.69†	64.32‡	70.84†‡	<0.000
D6: Communication about error	65.19†	65.27‡	72.89†‡	<0.000
D7: Communication openness	53.04†	53.31‡	64.61†‡	<0.000
D8: Reporting patient safety events	56.54	59.58	66.62	<0.000
D9: Management support for patient safety	63.61	64.32	62.92	0.35
D10: Handoffs and transitions	53.54†	55.56‡	69.28†‡	<0.000
D11: Teamwork across units§	59.38	60.16	NA	0.65
D12: Teamwork within units§	80.25	80.74	NA	0.78
Overall perceptions of patient safety§	57.35	59.13	NA	0.07
Average percent for all domains	57.42†	58.42‡	66.58†‡	<0.000
Overall events reported				
1–2	24.63	25.15	25.08	0.79
3–5	13.17	13.16	14.50	0.69
6–10	6.54	6.65	5.91	0.85
≥11	5.57	6.06	6.22	0.09
None	50.05	48.98	48.29	0.95

P < 0.05 was considered to be significant.

*The HSOPS 2.0 was used.

† and ‡ indicate the difference based on post hoc test.

§The HSOPS 1.0 was used.

Details of HSOPS 1.0 and HSOPS 2.0 composite measures, respectively, are as follows: D1: Teamwork within units, teamwork; D2: Staffing, staffing and work pace; D3: Organizational learning—continuous improvement; D4: Nonpunitive response to errors, response to error; D5: Supervisor, manager, or clinical leader support for patient safety; D6: Feedback and communication about errors, communication about error; D7: Communication openness; D8: Frequency of events reported, reporting patient safety events; D9: Management Support for Patient Safety, Hospital Management Support for Patient Safety; D10: Handoffs and transitions, handoffs and information exchange.

NA, not available.

the average patient safety rating, the overall patient safety grade was rated as excellent or very good by 60% to 70% of respondents in all cycles, whereas cycle 4 was significantly lower in the positive response than the other cycles, while the fair and poor were higher in cycle 4 (Fig. 2).

Table 4 demonstrates the average positive response by the bed capacity for hospitals with 50 to 100, 101 to 200, 201 to 300, 301 to 500, and more than 500 beds. The significant difference was mainly between C4 and the other cycles across most of the domains. However, the Organizational learning—continuous improvement domain was significantly lower in C4 across all hospital types, which means no improvement was observed in the last cycle. In hospitals with 301 to 500 and more than 501 beds, C3 was significantly higher than C4. In hospitals with 301 to 500 beds, there was a significant improvement between the 3 cycles in the Communication openness domain with 42%, 49.2%, and 60.9%, respectively. Moreover, in the same bed capacity hospital, a difference was observed between C2 and C4 with a 12% improvement in the Reporting patient safety events. Meanwhile, in the hospital with more than 500 beds, there was a significant improvement in the Reporting of patient safety events between C2 and C3 at 5.8% and between C2 and C4 at 10.1%. Notably, the Management support for the patient safety domain showed no significant difference across the 3 cycles among all types of hospitals. With regard to the overall positive percentage, hospitals with 101 to 200 beds had no difference across all cycles. Meanwhile,

the hospital with 301 to 500 beds showed a significant increase in the average positive response for all domains across all cycles (Table 4). Percentiles in Table 5 were derived from the positive response for both versions' data sets; accordingly, there was a slight increase in the median 50th percentile.
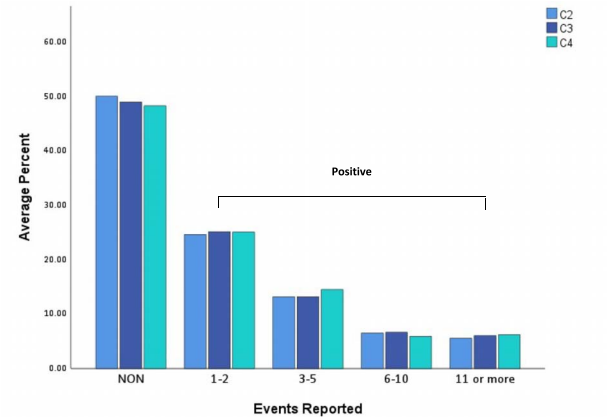

FIGURE 1. Average percentage of reporting patient safety events for all cycles. C2, 2019; C3, 2021; C4, 2022.
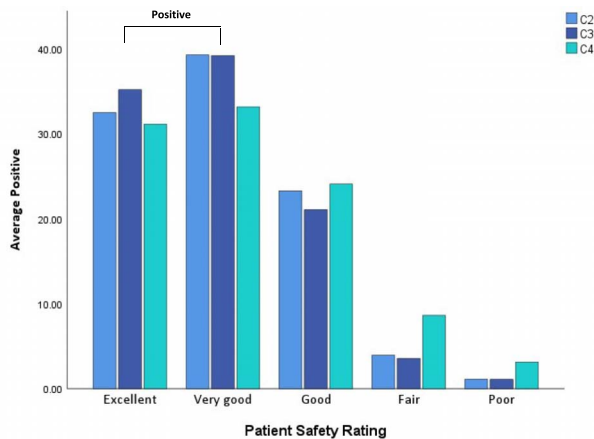
FIGURE 2. Average patient safety rating for all cycles. C2, 2019; C3, 2021; C4, 2022.

At the end of each cycle, areas of potential improvement according to the 3 lowest domains along with the highest 3 domains as the strength areas were reported (red and green dots in Figs. 3A, B). In C2, C3, and C4, the areas of strength according to the highest positive response domains were Teamwork within units, Organizational learning—continuous improvement, and Feedback and communication about errors, respectively, and remained the same among the 2 cycles. Meanwhile, the areas for potential improvement for C2 and C3, according to the lowest positive response domains, were Nonpunitive responses to errors at 24.89, 26.20%, Staffing 31.73, 31.90%, and Communication openness at 53.04, 53.31%, respectively. Similarly, in C4, the areas for potential improvement were slightly different Staffing and work pace 46.86%, Response to error 55.61, and Hospital management support for patient safety 62.95%.

Although the recommendations regarding the strength areas were generated at the end of each cycle, these areas did not reach the 75th percentile in both versions. Teamwork within units and Organizational learning—continuous improvement in V1.0 were 13.6% and 7%, respectively, lower than the 75th cutoff; however, these areas were considered at the top of the area of strength in V1.0. Whereas the area of strength in V2.0 was below the 75th cutoff, these domains focused on Teamwork, Organizational learning—continuous improvement, and Communication about errors in V2.0 with 5.5%, 5.69%, and 10%, respectively, lower than the cutoff (Figs. 3A, B).

DISCUSSION

This study has examined the trend and changes in the patient safety culture in Saudi Arabia across 3 cycles. The evidence identified in this study shows that the key gaps and weaknesses in the patient safety culture in the Saudi healthcare system were not improved. Interestingly, even the reported strengths have not changed through the 4 years, and they do not fall higher than 75% of the hospital. This highlights the need to act on priorities for the improvement of patient safety culture in Saudi hospitals.

The generated reports for the 3 cycles identified areas of strength and areas of potential improvement among Saudi hospitals; however, our results indicated that over the 3 cycles, no change was found in the reporting events, even with the use of different versions. Our findings highlighted the importance of monitoring the culture survey annual results and taking action, especially at the management level. The lack of effective leadership strategies to improve patient safety has a negative impact on the safety culture.[20]

This could attribute to the decrease in the positive average in the domain, which focuses on organizational learning and continuous improvement. A study conducted on nurses to examine the impact of organizational learning and continuous quality improvement found that there is an association between strong organizational learning culture and management involvement.[21,22] Accordingly, supportive leadership is one of the main factors in enhancing learning and building capacity among healthcare providers, which leads to shifting the patient safety culture positively.[23,24]

Although our results of the areas of strength were in agreement with a study conducted in Saudi Arabia (2010), the positive response was higher in 2010 than our results.[14] Notably, feedback and communication about errors in the Alahmadi 2010 study were much higher (77%) than all 3 cycles with (24.98, 26.19, and 55.61%, respectively).[14]

The positive response in our results was mostly higher in C4, which was expected according to the AHRQ, as the amendment on V2.0 added another option (not apply) in the answering scale. Despite that, there was no significant difference in Management support for patient safety domain across the 3 cycles. Moreover, if the average percentage was adjusted according to the pilot study by the AHRQ to test the difference between V1.0 and V2.0 composite measures, the Hospital management support for patient safety in v2.0 was 2 percentage points lower than V1.0.[25] Thus, it would be an indication of a decline in management support in the last year.

The positive response in the Organizational learning—continuous improvement domain was less in C4; however, if we adjust the percent of this domain according to the pilot study, the scores in V2.0 were 4% points higher compared with V1.0, which means no potential changes in the Continuous improvement.[25] Moreover, no significant difference was found in the average of positive responses in the number of events reported. This concluded that the positive response observed in C4 was due to the update on V2.0, not as an indication of improvement across the 3 cycles.

The results showed that the rate of patient safety was less positive in cycle 4; one possible reason for the reduction is the effect of the COVID-19 pandemic. The implication of COVID-19 and its impact on patient safety was foreseen globally; consequently, frameworks and initiatives were developed to help improve quality and patient safety.[26,27]

To baseline our results for V1.0 in cycles 2 and 3, a comparison with Lebanon and Oman was used. We found similar agreement in the average positive response in Teamwork within units (82 and 83, respectively). In contrast, the mean in both cycles among the team across units was higher than Lebanon scoring 56% and lower than Oman at 64%.[28,29] In comparison with Lebanon and Oman, our results were similar to Lebanon at 78% in Organizational learning—continuous improvement, whereas Oman scored higher at 84%.[28,29]

The end-cycle recommendations highlighted the weak areas; however, Staffing and work pace and Response to error remain at the weak spot across the 3 cycles, which specifies that interventions to improve culture are still unaccounted for. The staff shortage and inadequate staff ratio to the patient were addressed in many studies in Saudi in different hospitals, which could increase the workload and less time of care provided to the patient.[30,31] Therefore, it could be linked to the unchanged management support domain as it can play an important role by providing adequate resources and qualified staff. Effective management support could closely identify areas for support, such as the high-demand units to reduce burnout.

Moreover, Response to error indicates that reported issues could imply that healthcare providers still feel that their errors will be held against them and could be retained on their personnel files.

TABLE 4. Domains by Hospital Characteristics (Bed Capacity)

Bed Capacity	50–100			101–200			201–300			301–500			>501		
	n (Mean)			n (Mean)			n (Mean)			n (Mean)			n (Mean)		
Variable / Year of Cycle	2019 (n = 55)	2021 (n = 81)	2022 (n = 87)	2019 (n = 31)	2021 (n = 35)	2022 (n = 42)	2019 (n = 24)	2021 (n = 34)	2022 (n = 36)	2019 (n = 125)	2021 (n = 198)	2022 (n = 207)	2019 (n = 15)	2021 (n = 18)	2022 (n = 20)
D1	73.3	73.2	82.0*†	68.9	68.3	79.5*†	66.3	65.7	77.4*†	60.6	65.6	74*†	64	65	74.8*†
D2	32.8	33.5	48.2*†	32.2	31.5	46.7*†	31.9	30.6	45.6*†	30.5	30.7	42.7*†	29	30.7	43.2*†
D3	82.1	81.6	77.7*†	79.2	79.7	76 *†	79.3	78.5	74.7*†	75.6	78.0*‡	72.4*‡	75.9	77.3*‡	72.8*‡
D4	26.1	27.2	58.4*†	26.1	26.3	54.6 *†	23.2	23.8	52.6*†	19.1	23.9	49.0*†	21.8	23.3	50.0*†
D5	65.6	65.6	72.3*†	65.2	63.8	70.1 *†	61.2	62.8	69.3*†	56.7*	61.7*	67.1*	60.7	62.3	69.1*†
D6	68.2	66.2	73.8*†	65	65.1	72.4 *†	62.4	63.7	72.3*†	58.0	63.8	70.4*†	63.4	63.6	71.0*†
D7	56.7	55.4	66.7*†	53	53.2	63 *†	48.6	50.4	63.0*†	42.8*	49.2*	60.9*	45.8	47.2	60.5*†
D8	58.6	59.2	67.1*†	56.5	59.7	66.2 *†	53.1	58.4	66.5*†	52.9*‡	59.5	64.9*‡	56.7*‡§	62.5*§	66.8*‡†
D9	66.2	66.1	65.6	63.1	62	61.2	59.4	61.4	59.8	59.5	61.8	57.8	60.2	61.5	58.6
D10	58.9	59.4	72.2*†	53.2	52.7	67.9 *†	46.4	49.7	65.5*†	42.3	49.1	63.6 *†	45.1	48.8	64.9*†
D11	59.6	60.3	NA	57.6	58.2	NA	55.3	58.5	NA	52.3	57.8	NA	53.5	56.7	NA
D_ALL	60.0	60.0	68.4*†	57.4	57.4	65.8*†	54.4	55.6	64.6*†	50.8*	55.6*	62.3*	53.3	55.3	63.2*†

*$P < 0.05$.

†Indicates the difference between cycle 4 and others.

‡Indicates the difference between cycle 2 and others.

§Indicates the difference between cycle 3 and others.

Details of HSOPS 1.0 and HSOPS 2.0 composite measures, respectively, are as follows: D1: Teamwork within units, teamwork; D2: Staffing, staffing and work pace; D3: Organizational learning—continuous improvement; D4: Nonpunitive response to errors, response to error; D5: Supervisor, manager, or clinical leader support for patient safety; D6: Feedback and communication about errors, communication about error; D7: Communication openness; D8: Frequency of events reported, reporting patient safety events; D9: Management Support for Patient Safety, Hospital Management Support for Patient Safety; D10: Handoffs and transitions, handoffs and information exchange.

TABLE 5. Average Percent Positive, SD, Minimum and Maximum Scores, and Percentiles for Each of the V 1.0, and V 2.0 Composite Measures

Domain	Average % Positive	SD	Min	10th %	25th %	50th %	75th %	90th %	Max
Survey item percentile positive response version 1.0									
D1	70.05	14.25	0	50	60	73	81	86	100
D2	31.94	7.57	0	25	27	31	35	40	95
D3	80.24	6.53	32	73	76	81	84	88	100
D4	25.64	9.05	0	17	20	24	29	35	97
D5	64.15	8.16	0	55	59	64	69	74	100
D6	65.40	9.16	0	56	60	65	70	76	100
D7	53.16	9.32	0	43	48	53	58	64	100
D8	58.37	10.22	0	48	53	58	64	69	100
D9	63.92	11.25	0	50	56	64	71	77	100
D10	54.75	12.48	0	41	47	54	62	70	100
D11	58.5254	7.27	22	51	54	58	62	66	100
All-D	58.01	18.11	0	29	49	60	70	81	100
Survey item percentile positive response version 2.0									
D1	79.85	7.26	45	71	75	80	84	89	100
D2	46.86	10.17	18	37	40	45	52	60	99
D3	76.26	7.70	45	67	71	76	81	85	100
D4	55.60	10.60	29	44	49	54	61	67	99
D5	70.83	7.97	43	62	66	71	75	80	100
D6	72.88	8.23	43	63	68	73	78	81	100
D7	64.61	8.44	29	56	60	64	69	73	99
D8	66.62	9.13	12	57	62	66	71	77	100
D9	62.94	10.71	33	49	56	63	69	75	100
D10	69.28	9.92	32	57	63	70	75	80	100
All-D	66.57	12.99	12	48	59	68	75	82	100

Ninetieth percentile = 90% of the hospitals scored the same or lower. Tenth percentile = 10% of the hospitals scored higher.

Collecting data annually would proactively help identify areas to improve the safety culture safety. Accordingly, based on the cycle results, the SPSC recommended using the downloadable Just Culture Guide initiated at the facility Web site embedded with the facility-tailored report.[32] This was followed by conducting a Just Culture maturity assessment survey at a national level to evaluate the just culture effort in Saudi Arabia. Studies showed that just culture could encourage reporting that potentially promote learning from reporting the events, which helps reduce harm.

Furthermore, exploring the percentiles in our results could give better insights when forming the patient safety culture recommendations; this is emphasized by our results where the mean of the 3 areas of strength did not reach the 75 percentile or above. Thus, the label of strengths according to the ranking may mislead the hospitals; accordingly, the use of the cutoff will help the hospital allocate them to explore the weaknesses and strengths.

One of the limitations of this study is the usage of different versions; however, the relevancy of the domains was checked, and
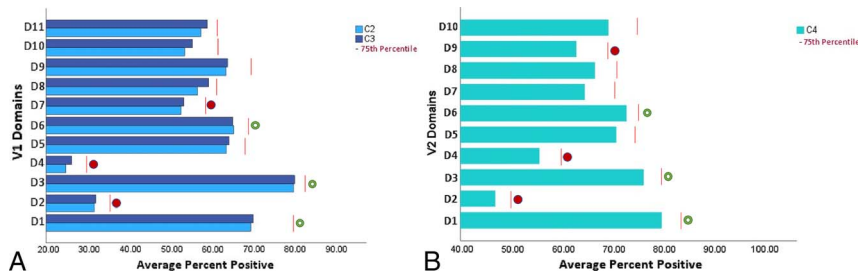

FIGURE 3. A, Average percent positive of all domains with the 75th percentile. B, Average percent positive of all domains with the 75th percentile. 🔴 Areas of potential for improvement. 🟢 Areas of strength for the hospital. Details of HSOPS 1.0 and HSOPS 2.0 Composite Measures, respectively. D1, Teamwork within units, teamwork; D2, Staffing, staffing and work pace; D3, Organizational learning—continuous improvement; D4, Nonpunitive response to errors, response to error; D5, Supervisor, manager, or clinical leader support for patient safety; D6, Feedback and communication about errors, communication about error; D7, Communication openness; D8, Frequency of events reported, reporting patient safety events; D9: Management Support for Patient Safety, Hospital Management Support for Patient Safety; D10, Handoffs and transitions, handoffs and information exchange.

accumulative results were assessed. More investigations can focus on change over the years in both safety culture and the effectiveness of implementing interventions to measure the impact on the quality of care.

CONCLUSIONS

This study assessed the patient safety culture trend in Saudi Arabia using retrospective national data. The study compared the positive average percentage of the Hospital Survey on Patient Safety Culture consisting of 3 cycles conducted over 4 years, among the hospitals in Saudi Arabia, and generated a percentile for both versions.

To offer context for the culture of patient safety, more research is required. One of the areas that need to be considered as an integral part of the Saudi healthcare quest is Organizational learning—continuous improvement.

REFERENCES

1. Kohn LT, Corrigan JM, Donaldson MS. To Err Is Human: Building a Safer Health System. Committee on Quality of Health Care in America (Washington): Institute of Medicine;2000.

2. Wagner C, Gulácsi L, Takacs E, et al. The implementation of quality management systems in hospitals: a comparison between three countries. *BMC Health Serv Res*. 2006;6:50.

3. Sochalski J. Quality of care, nurse staffing, and patient outcomes. *Policy Polit Nurs Pract*. 2001;2:9–18.

4. The Director-General. *Patient Safety—Global Action on Patient Safety*. Geneva, Switzerland: World Health Organization; 2019.

5. Morello RT, Lowthian JA, Barker AL, et al. Strategies for improving patient safety culture in hospitals: a systematic review. *BMJ Qual Saf*. 2013;22:11–18.

6. Bari A, Khan RA, Rathore AW. Medical errors; causes, consequences, emotional response and resulting behavioral change. *Pak J Med Sci*. 2016;32:523–528.

7. Rockville MD. What is patient safety culture? Content last reviewed March 2022. Agency for Healthcare Research and Quality. Available at: https://www.ahrq.gov/sops/about/patient-safety-culture.html. Accessed August 20, 2023.

8. Abusalem S, Polivka B, Coty MB, et al. The relationship between culture of safety and rate of adverse events in long-term care facilities. *J Patient Saf*. 2021;17:299–304.

9. Sorra J, Khanna K, Dyer N, et al. Exploring relationships between patient safety culture and patients' assessments of hospital care. *J Patient Saf*. 2012;8:131–139.

10. Brown DS, Wolosin R. Safety culture relationships with hospital nursing sensitive metrics. *J Healthc Qual*. 2013;35:61–74.

11. Elmontsri M, Almashrafi A, Banarsee R, et al. Status of patient safety culture in Arab countries: a systematic review. *BMJ Open*. 2017;7:e013487.

12. Almutairi KM. Culture and language differences as a barrier to provision of quality care by the health workforce in Saudi Arabia. *Saudi Med J*. 2015;36:425–431.

13. Al Wahabi S, Farahat F, Bahloul AY. Prevalence and preventability of sentinel events in Saudi Arabia: analysis of reports from 2012 to 2015. *East Mediterr Health J*. 2017;23:492–499.

14. Alahmadi HA. Assessment of patient safety culture in Saudi Arabian hospitals. *Qual Saf Health Care*. 2010;19:e17.

15. Sorra JM, Franklin MAS, Streagle MA. Survey user's guide: nursing home survey on patient safety culture. 2008. Available at: http://www.ahrq.gov. Accessed December 21, 2022.

16. Sorra J, Gray L, Streagle S, Famolaro T, Yount N, Behm J. AHRQ hospital survey on patient safety culture: user's guide. 2018. Available at: https://www.ahrq.gov/sites/default/files/wysiwyg/professionals/quality-patient-safety/patientsafetyculture/hospital/userguide/hospitalusersguide.pdf. Accessed August 21, 2022.

17. Agency for Healthcare Research and Quality. Hospital Survey on Patient Safety Culture. Available at: https://www.ahrq.gov/sops/surveys/hospital/index.html. Accessed August 21, 2022.

18. SPSC. Hospital Survey on Patient Safety Culture National Project in the Kingdom of Saudi Arabia. Available at: https://www.spsc.gov.sa/English/HSPSC/Pages/default.aspx. Accessed August 23, 2022.

19. Horowitz G, Altaie S, Boyd J, et al. Defining, establishing, and verifying reference intervals in the clinical laboratory: approved guideline. *CLSI*. 2008;20:59. Available at: https://books.google.com/books/about/Defining_Establishing_and_Verifying_Refe.html?id=GG7FtgAACAAJ. Accessed December 22, 2022.

20. Adams-Pizarro I, Walker Z, Robinson J, et al. Using the AHRQ hospital survey on patient safety culture as an intervention tool for regional clinical improvement collaboratives. In: *Advances in Patient Safety: New Directions and Alternative Approaches (Vol 2: Culture and Redesign)*. Rockville, MD: Agency for Healthcare Research and Quality (US); 2008. Available at: https://www.ncbi.nlm.nih.gov/books/NBK43728/. Accessed December 25, 2022.

21. Rondeau KV, Wagar TH. Organizational learning and continuous quality improvement: examining the impact on nursing home performance. 5. *Healthc Manage Forum*. 2016;15:17–23. doi:101016/S0840-4704(10)60576-5.

22. Moafimadani SK, Kazempour E, Khalkhali A, et al. Effective factors on management of nurses organizational learning: a qualitative study. *J Nurs Midwifery Sciences*. 2020;7:52.

23. Nembhard IM, Tucker AL. Applying organizational learning research to accountable care organizations. *Med Care Res Rev*. 2016;73:673–684.

24. Granerud RL, Rocha RS. Organisational learning and continuous improvement of health and safety in certified manufacturers. *Saf Sci*. 2011;49:1030–1039.

25. Sorra J, Famolaro T, Yount N. Transitioning to the SOPS™ Hospital Survey Version 2.0: What's Different and What to Expect, Part I: Main Report. Prepared by Westat, Rockville, MD, under Contract No. HHSP233201500026I/HHSP23337004T. Rockville, MD: Agency for Healthcare Research and Quality; September 2019. AHRQ Publication No. 19-0076-1-E

26. Staines A, Amalberti R, Berwick DM, et al. COVID-19: patient safety and quality improvement skills to deploy during the surge. *Int J Qual Health Care*. 2021;33:mzaa050.

27. Sterling RS, Berry SA, Herzke CA, et al. Patient safety and quality improvement adaptation during the COVID-19 pandemic. *Am J Med Qual*. 2021;36:57–59.

28. Al-Mandhari A, Al-Zakwani I, Al-Kindi M, et al. Patient safety culture assessment in Oman. *Oman Med J*. 2014;29:264–270.

29. El-Jardali F, Jaafar M, Dimassi H, et al. The current state of patient safety culture in Lebanese hospitals: a study at baseline. *International J Qual Health Care*. 2010;22:386–395.

30. Al-Ahmadi TA. Measuring patient safety culture in Riyadh's hospitals: a comparison between public and private hospitals. *J Egypt Public Health Assoc*. 2009;84:479–500.

31. Al-Awa B, Al Mazrooa A, Rayes O, et al. Benchmarking the post-accreditation patient safety culture at King Abdulaziz university hospital. *Ann Saudi Med*. 2012;32:143–150. doi:10.5144/0256-4947.2012.143.

32. SPSC. Just Culture toolkit. JustCulture Just-Culture-Toolkit (spsc.gov.sa). Available at: https://www.spsc.gov.sa/English/HSPSC/JustCulture/Pages/Just-Culture-Toolkit.aspx. Accessed May 14, 2023.