



# BMJ Open Quality Patient safety culture in South America: a cross-sectional study

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## ABSTRACT

**Background** Every year, millions of patients suffer injuries or die due to unsafe and poor-quality healthcare. A culture of safety care is crucial to prevent risks, errors and harm that may result from medical assistance. Measurement of patient safety culture (PSC) identifies strengths and weaknesses, serving as a guide to improvement interventions; nevertheless, there is a lack of studies related to PSC in Latin America.

**Aim** To assess the PSC in South American hospitals.

**Methods** A multicentre international cross-sectional study was performed between July and September 2021 by the Latin American Alliance of Health Institutions, composed of four hospitals from Argentina, Brazil, Chile and Colombia. The Hospital Survey on Patient Safety Culture (HSOPSC V.1.0) was used. Participation was voluntary. Subgroup analyses were performed to assess the difference between leadership positions and professional categories.

**Results** A total of 5695 records were analysed: a 30.1% response rate (range 25%–55%). The highest percentage of positive responses was observed in items related to patient safety as the top priority (89.2%). Contrarily, the lowest percentage was observed in items regarding their mistakes/failures being recorded (23.8%). The strongest dimensions (average score  $\geq 75\%$ ) were organisational learning, teamwork within units and management support for patient safety (82%, 79% and 78%, respectively). The dimensions ‘requiring improvement’ (average score  $< 50\%$ ) were staffing and non-punitive responses to error (41% and 37%, respectively). All mean scores were higher in health workers with a leadership position except for the hospital handoff/transitions item. Significant differences were found by professional categories, mainly between physicians, nurses, and other professionals.

**Conclusion** Our findings lead to a better overview of PSC in Latin America, serving as a baseline and benchmarking to facilitate the recognition of weaknesses and to guide quality improvement strategies regionally and globally. Despite South American PSC not being well-exploited, local institutions revealed a strengthened culture of safety care.

## BACKGROUND

Every year, millions of patients suffer injuries or die because of unsafe and poor-quality healthcare, mainly in low and middle-income settings.<sup>1</sup> Many medical practices and risks

## WHAT IS ALREADY KNOWN ON THIS TOPIC

- ⇒ Measuring patient safety culture (PSC) enables the identification of strengths and areas for improvement, serving as a guide to further interventions and investments.
- ⇒ PSC has been well reported in developed countries but has not been explored enough in low and middle-income settings.

## WHAT THIS STUDY ADDS

- ⇒ The PSC of four middle-income countries was assessed and analysed, bringing new insights into the PSC in South American healthcare institutions.

## HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

- ⇒ Better overview of PSC in Latin America serving as a baseline and benchmarking to facilitate the recognition of weaknesses and to guide quality improvement strategies regionally and globally.

associated with clinical care are emerging as significant challenges for patient safety. In this context, the search for a culture of safety care is crucial to delivering quality-essential health services to prevent risks, errors and harm that occur to patients while providing medical assistance.<sup>2</sup>

A mature health system considers the increasing complexity in care settings that make humans more prone to mistakes. In response, health institutions set values, expectations, practices and behaviours to define a proper environment to promote safety management. Patient safety culture (PSC) is focused on the aspects of organisational culture that relates to safety care, being defined as a pattern of individual and organisational behaviour based on shared beliefs and values that continuously seek to minimise patient damage that may result from the process of care delivery.<sup>2,3</sup>

The measurement of PSC identifies strengths and areas for improvement, serving as a guide to developing appropriate

interventions and investments. Clinical and non-clinical staff observe different aspects of how the hospital works and have the potential to identify what is going well and what could be done better.<sup>4</sup> PSC can be measured through questionnaires of hospital staff, qualitative evaluations (focus groups, interviews), ethnographic investigation or a combination of these, but surveys are still the most common way of measurement.<sup>4,5</sup>

The Agency for Healthcare Research and Quality's (AHRQ) developed the Hospital Survey on Patient Safety Culture (HSOPSC) in 2004—V.1.0, with an updated version released in 2019 (V.2.0).<sup>6</sup> The survey is used internationally and is designed to measure staff opinions regarding patient safety issues, medical errors and safety event reporting. Different organisations concerned with PSC use this assessment as a tool to identify opportunities for quality improvement interventions.<sup>7,8</sup>

Despite international accreditation, a recent systematic review evidenced a lack of studies on PSC assessment in Latin American institutions.<sup>9</sup> Thus, this study aimed to report the quality and PSC in South American hospitals to better overview regional PSC and establish a unified safety culture in developing countries.

## METHODS

### Context

The work of the WHO on patient safety began with the launch of the World Alliance for Patient Safety in 2004, facilitating improvements in the safety of healthcare and establishing the Global Patient Safety Challenges.<sup>10</sup> WHO has also encouraged the creation of networking and collaborative initiatives, such as the Global Patient Safety Network and the Global Patient Safety Collaborative, to engage nations in the patient safety agenda.<sup>11</sup>

This study is part of different actions carried out by the Latin American Alliance of Health Institutions (from the Spanish: *Alianza Latinoamericana de Instituciones de Salud—ALIS*), a coalition created in collaboration with the Institute for Healthcare Improvement for cooperation in quality, safety and management initiatives among Latin American hospitals.

### Type of study

A multicentre international cross-sectional study was performed between July and September 2021. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement was followed as recommended (online supplemental table 1S).<sup>12</sup>

### Participants

ALIS comprises four private referral hospitals in South America: (I) *Hospital Universitario Austral*—Argentina, (II) *Hospital Israelita Albert Einstein*—Brazil, (III) *Clínica Alemana de Santiago*—Chile and (IV) *Fundación Santa Fe de Bogotá*—Colombia. All the institutions are considered to be one of the best hospitals in their respective countries and among the best hospital in Latin America. All of them have accreditation and certification by the Joint

Commission International. Further information on the participating hospitals, including localisation, size (number of workers and beds) and medical education provisions, is found in online supplemental table 2S.

### Measuring patients safety culture

The HSOPSC V.1.0 from the AHRQ, structured and validated in Spanish<sup>13</sup> and Portuguese,<sup>14</sup> was used to assess and measure the PSC in the participating institutions. HSOPSC uses the *Likert scale* to evaluate all dimensions of PSC. Additionally, one question is related to the patient's perception of safety, and another relates to the employee's behaviour in reporting incidents in the referred institution, totalising 42 items divided into 12 dimensions.

Percentages of positive responses to the HSOPSC items were calculated by adding the responses: I totally agree and agree (or always and most of the time) for each item, and then dividing by the total number of responses present, ignoring missing responses. For items with a negative statement (identified by R after the item number), negative responses are given by the alternatives: I totally disagree and I disagree (or never and rarely) for each item.

For each participant, the percentages of positive responses (scores) for each dimension were calculated by the sum of positive responses divided by the number of valid responses since more than half of the responses from the item that make up a dimension were present (three items for dimensions formed by four, and two items for dimensions formed by three). A dimension was considered strengthened when the percentage of positive responses was equal to or greater than 75%, and the dimensions with greater weakness were equal to or less than 50%.<sup>15</sup> The range between these cut points is considered suitable but requires improvement.

The survey was made available online for the four institutions during the same period, and they were randomly numbered to keep institutional data anonymous. Healthcare professionals were invited to participate anonymously and voluntarily, without inducements or reprisal. HSOPSC was carried out using the *RedCap* system<sup>16</sup> to respect the data protection laws applicable to each country. Forms filled out without any response or with insufficient information were excluded from the sample.

### Subgroup analysis

Complementary analyses were performed to further assess insights in PSC, including the difference between the perceptions of health workers by: leadership positions, professional categories (ie, physician, nurse, others), teaching hospital, direct contact with the patient, hospital units, time spent in the hospital, time spent in the position, time in the professional category and hours per week.

### Statistics

Observed data were described globally and by subgroups. For qualitative variables, absolute and relative frequencies

were used. Quantitative variables were contrasted by normal plot and examined by the *Shapiro-Wilk* test as recommended, and depending on sample distribution, observed means and SD or medians and quartiles were calculated. Minimum and maximum values were also reported.

To analyse the proportions of positive responses of the HSOPSC's dimensions, generalised linear models with negative binomial distribution and logarithmic link function were adjusted, contemplating the dependence between the responses of employees who work in the same institution. For the positive answers given to the items related to the perception of patient safety in the institution and the employee's behaviour with the notification of occurrences, we used generalised linear models with a binomial distribution.

The significance level was set to  $\alpha=5\%$ . Model results were presented as estimated mean values, 95% CIs, and *p* values as appropriate. *P* values of multiple comparisons between categories were corrected using the sequential Bonferroni method. Statistical analysis was performed using SPSS V.21, USA.

## RESULTS

The *RedCap* platform registered 5745 records of responses from professionals from the four participating institutions. The overall response rate was 30.1% and was distributed as follows: *Hospital Universitario Austral*, 30%; *Hospital Israelita Albert Einstein*, 26%; *Clínica Alemana de Santiago*, 25% and *Fundación Santa Fe de Bogotá*, 55%.

A total of 50 responses were excluded due to insufficient information: 46 completed only general information, without any response to the items referring to the area/unit of work in the hospital, used in the calculation of the percentages of positive responses by dimension; and four filled in only one or two answers referring to the area/unit of work in the hospital, but insufficient to calculate the percentage of positive answers for at least one dimension.

Characteristics of the survey participants (5695 validated records) are described in [table 1](#). The Brazilian institution recorded most of the data (36.9%), and most came from no-teaching hospitals (59.6%). Among the respondents, 81.2% had direct contact with patients, most of whom were from the nursing team (37.2%). Only 4.9% of the health workers hold a leadership position.

[Table 2](#) presents the distributions of positive answers for each item of the HSOPSC. The highest percentage of positive responses was observed in item F8: the actions of hospital management show that patient safety is a top priority, with 4999 (89.2%) respondents agreeing. Conversely, the lowest percentage of positive responses was observed in item A16R: professionals (regardless of the employment relationship) worry that mistakes they make are kept in their personnel file, with 1289 (23.8%) disagreeing with the statement.

**Table 1** Characteristics of the survey participants (5695 validated records)

Characteristic	Frequency (%)
<b>Institution</b>	
<i>Hospital Universitario Austral</i> —Argentina	904 (15.9)
<i>Hospital Israelita Albert Einstein</i> —Brazil	2103 (36.9)
<i>Clínica Alemana de Santiago</i> —Chile	1290 (22.7)
<i>Fundación Santa Fe de Bogotá</i> —Colombia	1398 (24.5)
<b>Teaching hospital</b>	
No	3393 (59.6)
Yes	2302 (40.4)
<b>Hospital unit</b>	
Nursing	957 (16.8)
Radiology	617 (10.8)
Emergency room	337 (5.9)
Intensive care unit	614 (10.8)
Other	3170 (55.7)
<b>Time in the hospital</b>	
Until 1 year	828 (14.6)
1–5 years	1726 (30.4)
6–10 years	1191 (21.0)
11–15 years	832 (14.7)
16–20 years	466 (8.2)
Over 20 years	627 (11.1)
Total of responses	5670
<b>Time in the position</b>	
Until 1 year	1000 (17.6)
1–5 years	2010 (35.5)
6–10 years	1150 (20.3)
11–15 years	710 (12.5)
16–20 years	333 (5.9)
Over 20 years	466 (8.2)
Total of responses	5669
<b>Hours per week</b>	
<20 hour	225 (4.0)
20–39 hour	1714 (30.4)
40–59 hour	3355 (59.4)
60–79 hour	206 (3.6)
80–99 hour	54 (1.0)
≥100 hour	93 (1.6)
Total of responses	5647
<b>Leadership position</b>	
No	5417 (95.1)
Yes	278 (4.9)
<b>Professional category</b>	
Physician	1223 (21.5)

Continued

**Table 1** Continued

Characteristic	Frequency (%)
Nurse	2120 (37.2)
Multi-professional team	835 (14.7)
Other	1517 (26.6)
Direct contact with the patient	
No	1064 (18.8)
Yes	4590 (81.2)
Total of responses	5654
Time in the professional category	
Until 1 year	370 (6.5)
1–5 years	1394 (24.6)
6–10 years	1217 (21.5)
11–15 years	966 (17.0)
16–20 years	678 (12.0)
Over 20 years	1041 (18.4%)
Total of responses	5666

Asymmetrical distributions were observed among dimension scores, with a concentration of higher values for most of the dimensions, emphasising teamwork within units, organisational learning and continuous improvement, management support for patient safety, and feedback and communication about errors. The worst performances were observed in the staffing and non-punitive response to error items (online supplemental graphic 1). [Table 3](#) summarises the performance in each dimension.

Estimated mean scores of professionals in leadership compared with non-leadership positions are described in [table 4](#). [Table 4](#) highlights that all mean scores were higher in health workers in leadership positions except for hospital handoffs and transitions.

Estimated mean differences between teaching institutions and health workers in direct contact with the patients are presented in online supplemental tables 3S and 4S, respectively.

Finally, [table 5](#) compares the observed scores among the dimensions' professional categories.

Further comparisons among hospital units, time in the hospital, time in the position, time in the professional category and hours per week is found in online supplemental tables 5S and 9S respectively.

## DISCUSSION

Despite WHO efforts to engage nations to set clear safety goals and performance indicators as part of an ongoing process of improvement in the international patient safety agenda, there is still a rising concern about the level of harm among patients in developing countries due to the lack of accountability and the limited reports of safety. Considering the scarcity of research on this subject, especially in Latin American countries, the ALIS

**Table 2** Positive answers for each item of the Hospital Survey on Patient Safety Culture

Hospital Survey on Patient Safety Culture Dimensions and items	Total of responses*	Positive responses (average% positive)†
Dimension 1 – teamwork within units		
A1	5668	4770 (84.2)
A3	5653	4660 (82.4)
A4	5662	4967 (87.7)
A11	5633	3643 (64.7)
Dimension 2 – expectations and actions promoting patient safety		
B1	5612	4308 (76.8)
B2	5606	4424 (78.9)
B3R	5578	2985 (53.5)
B4R	5578	4283 (76.8)
Dimension 3 – organisational learning – continuous improvement		
A6	5597	4870 (87.0)
A9	5577	4589 (82.3)
A13	5543	4388 (79.2)
Dimension 4 – management support for patient safety		
F1	5615	4885 (87.0)
F8	5606	<b>4999 (89.2)</b>
F9R	5587	3307 (59.2)
Dimension 5 – feedback and communication about errors		
C1	5537	4014 (72.5)
C3	5555	3899 (70.2)
C5	5566	4476 (80.4)
Dimension 6 – frequency of events reported		
D1	5436	3960 (72.8)
D2	5425	3804 (70.1)
D3	5399	4063 (75.3)
Dimension 7 – overall perceptions of patients' safety		
A10R	5408	2889 (53.4)
A15	5433	3030 (55.8)
A17R	5450	3743 (68.7)
A18	5464	4429 (81.1)
Dimension 8 – communication openness		
C2	5484	4240 (77.3)
C4	5481	2670 (48.7)
C6R	5486	2783 (50.7)
Dimension 9 – teamwork across units		
F2R	5499	2723 (49.5)
F4	5519	3631 (65.8)
F6R	5499	3586 (65.2)
F10	5506	4026 (73.1)
Dimension 10 – staffing		

Continued

**Table 2** Continued

Hospital Survey on Patient Safety Culture Dimensions and items	Total of responses*	Positive responses (average% positive)†
A2	5543	2171 (39.2)
A5R	5433	2157 (39.7)
A7R	5324	2440 (45.8)
A14R	5453	2224 (40.8)
Dimension 11—handoffs and transitions		
F3R	5306	3139 (59.2)
F5R	5286	3293 (62.3)
F7R	5268	2984 (56.6)
F11R	5267	3466 (65.8)
Dimension 12—non-punitive response to error		
A8R	5441	2360 (43.4)
A12R	5427	2428 (44.7)
A16R	5412	<b>1289 (23.8)</b>
E1‡	5506	4521 (82.1)
G1§	5366	2184 (40.7)

Bold: Higher and lower scores. Item classification is available in the SOPS Hospital Survey Items and Composite (available from <https://www.ahrq.gov>).

\*Total responses excluding missing responses.

†Total responses strongly agree and agree for items with a positive statement and strongly disagree and disagree for items with a negative statement, identified with an R next to the item number.

‡Positive responses: excellent and very good.

§Positiveonline supplemental file 1 responses: all alternatives, except none.

aimed to assess four South American healthcare institutions together to bring new insights into the local PSC. As a result, our findings allow a broader overview of the

regional safety culture and enhance the understanding of health workers' perceptions in the context of Latin American developing countries.

### Benchmarking in Latin American settings

A recent systematic review by Camacho-Rodriguez *et al*,<sup>9</sup> confirmed the global concern about the PSC in Latin America, revealing that only 30 studies, limited only to five countries (none from Central America), reported a PSC evaluation. Most of these studies are from Brazil (22 studies),<sup>17–38</sup> and only three and one from Colombia<sup>39–41</sup> and Argentina,<sup>42</sup> respectively. However, no Chilean studies have assessed PSC. Another recent review by Prieto *et al*<sup>43</sup> in 2021 included 36 studies assessing PSC, reporting 24 additional studies from Brazil,<sup>44–67</sup> of which 11 were master's degree theses or doctoral dissertations.<sup>44–46 49 54–59 63</sup> Additionally, we found another Colombian study reporting PSC assessments.<sup>68</sup>

Most of these studies were performed in single units, such as surgical services<sup>17 19 26 39 40 51 54 58</sup> and intensive care units,<sup>20 31 36 37 53 55 67</sup> or applied to a unique professional category, mainly nursing staff.<sup>20–23 26 34 35 48 52 53 55 58 63 65 66</sup> Moreover, some studies have used HSOPSC for different purposes or have not shown areas of strength or critical areas.<sup>43</sup> Considering these limitations, the PSC assessment reported by these studies may represent microcultures rather than an institutional culture of safe care. Therefore, establishing a local benchmark in Latin America remains challenging.

Our initiative includes an assessment of Chilean participants for the first time, and it is also the first to evaluate four South American hospitals simultaneously. This collaboration allows us to explore the regional PSC in a unified way and facilitates further contrast with other groups of hospitals.

**Table 3** Distribution of positive responses of Hospital Survey on Patient Safety Culture

Dimensions	Observed average (SD)	Q1	Median*	Q3	N	Estimated average (95% CI)
Teamwork within units	79.8 (±29.7)	75.0	100.0	100.0	5666	79.7 (78.2 to 81.2)
Expectations and actions promoting patient safety	71.5 (±31.3)	50.0	75.0	100.0	5602	69.6 (63.5 to 76.3)
Organisational learning—continuous improvement	82.9 (±30.6)	67.0	100.0	100.0	5593	81.8 (77.5 to 86.2)
Management support for patient safety	78.6 (±28.8)	67.0	100.0	100.0	5629	77.4 (73.6 to 81.5)
Feedback and communication about errors	74.4 (±35.9)	67.0	100.0	100.0	5579	73.6 (70.4 to 77.0)
Frequency of events reported	72.8 (±39.7)	33.0	100.0	100.0	5432	70.4 (61.8 to 80.2)
Overall perceptions of patients' safety	64.7 (±29.3)	50.0	75.0	100.0	5449	65.4 (59.7 to 71.7)
Communication openness	59.0 (±36.0)	33.0	67.0	100.0	5515	58.8 (56.6 to 61.0)
Teamwork across units	63.4 (±35.8)	25.0	75.0	100.0	5516	63.1 (59.8 to 66.6)
Staffing	41.3 (±33.2)	25.0	25.0	75.0	5438	40.2 (36.8 to 44.1)
Handoffs and transitions	61.0 (±40.5)	25.0	75.0	100.0	5270	60.3 (52.4 to 69.3)
Non-punitive response to error	37.3 (±39.1)	0.0	33.0	67.0	5445	37.5 (35.0 to 40.1)

\*All minimum values were 0, and all maximum values were 100.

**Table 4** Estimated mean differences for the percentages of positive responses in the dimensions of the Hospital Survey on Patient Safety Culture between healthcare professionals holding a leadership position or those who are not

Dimensions	Leadership position		Contrasts	
	Yes	No	Yes–No (CI 95%)	P value
Teamwork within units	86.9 (82.0 to 92.1)	79.3 (78.0 to 80.6)	7.6 (3.2 to 12.0)	<b>0.001</b>
Expectations and actions promoting patient safety	76.7 (70.3 to 83.8)	69.2 (63.0 to 76.1)	7.5 (3.5 to 11.5)	<b>&lt;0.001</b>
Organisational learning—continuous improvement	83.3 (80.6 to 86.1)	81.7 (77.3; 86.3)	1.6 (1.4 to 4.7)	0.292
Management support for patient safety	84.9 (79.7 to 90.4)	77.0 (73.0 to 81.3)	7.9 (3.1 to 12.6)	<b>0.001</b>
Feedback and communication about errors	75.8 (73.7 to 77.8)	73.5 (70.2 to 77.0)	2.3 (0.8 to 5.3)	0.142
Frequency of events reported	76.0 (63.0 to 91.6)	70.1 (61.7 to 79.6)	5.9 (0.3 to 11.5)	<b>0.040</b>
Overall perceptions of patients' safety	68.5 (62.2 to 75.4)	65.2 (59.6 to 71.5)	3.2 (0.5 to 7.0)	0.093
Communication openness	68.6 (62.3 to 75.6)	58.2 (55.7 to 60.9)	10.4 (2.4 to 18.4)	<b>0.011</b>
Teamwork across units	68.7 (66.4 to 71.1)	62.8 (59.1 to 66.7)	6.0 (0.0 to 11.9)	0.051
Staffing	47.7 (44.2 to 51.4)	39.8 (36.1 to 44.0)	7.8 (2.6 to 13.1)	<b>0.003</b>
Handoffs and transitions	59.5 (50.1 to 70.5)	60.3 (52.5 to 69.3)	0.9 (–4.7 to 3.0)	0.663
Non-punitive response to error	53.4 (48.1 to 59.2)	36.6 (33.8 to 39.6)	16.7 (9.2 to 24.3)	<b>&lt;0.001</b>

Bold: significant p value.

### Strengthened dimensions

The dimensions with higher scores in our sample were teamwork within units, organisational learning and continuous improvement, management support for patient safety, and feedback and communication about errors. None of the Brazilian, Colombian or Argentinian studies assessing PSC institutionally were performed during 2021. According to Prieto's review,<sup>43</sup> which included Brazilian pre-pandemic studies, teamwork within units, organisational learning and continuous improvement and management support for patient safety were also found to be strong areas.<sup>17 36 51 53 65 66</sup> Expectations and actions promoting patient safety and frequency of reporting events were also reported as strong areas.<sup>33 36 60</sup>

Notably, despite limitations related to PSC measurement in Latin American settings, the participating institutions of our sample have a high perception of safety culture, comparable to 630 American institutions reported by AHRQ in 2018.<sup>69</sup> The item related to actions of the hospital management shows that patient safety is a top priority, showed the highest positive answers in our sample (89.2%). No significant differences were found in the dimension of overall perception of safety when compared with AHRQ report (65.4% (CI 95% 59 to 71), and 66%, respectively). Contrasting to local settings, the review of Latin American studies showed only 48.8% of positive responses in this dimension,<sup>9</sup> similar to a national report by the Brazilian Health Regulatory Agency—ANVISA (49.5%) performed in 301 hospitals during 2021.<sup>70</sup> It would be expected that workers in leaderships position report a more positive assessment of safety than clinicians because of their investment in the organisation's hierarchy and functions.<sup>71 72</sup> However, no significant differences were found in this dimension in our sample (p value=0.093).

Another interesting aspect is the teamwork: (i) teamwork within units was lower than the reported scores by AHRQ<sup>69</sup> (79.7% (CI 95% 78 to 81) and 82%, respectively), but higher when compared with the Brazilian national report (73.2%),<sup>70</sup> and (ii) teamwork across units was higher than AHRQ and ANVISA records (63.1% (CI 95% 59 to 66), 62% and 58.6%, respectively).<sup>69 70</sup> Differences were found between physicians and other professional categories for both teamwork dimensions, showing higher results in the medical team (p value <0.001 for all), which has also been reported in the previous Brazilian studies.<sup>19</sup> Leadership positions also revealed higher values in both teamwork dimensions: 7.6 (CI 95% 3 to 12) and 6.0 (CI 95% 0 to 11) percentage points higher for teamwork within and across units' dimensions, respectively, when compared with health workers not-holding a leadership position. High scores on these dimensions indicate a ward where healthcare professionals support each other, treat each other with respect and work together as a team. Opposite to other studies,<sup>9</sup> in our sample, the nursing team does not evidence higher values in teamwork. A recent systematic review by Vaismoradi *et al*<sup>73</sup> revealed that nurses working together within units directly impact care quality and patient safety in hospitals through their continuous quality improvement activities.

### Dimensions 'requiring improvements'

The worst rated item was the concerns related to mistakes or failures being recorded in their files (23.8%), which is also the worst performing item in American hospitals, with a 39% average of positive responses.<sup>69</sup> The two dimensions with the lower performances were staffing (40.2% (CI 95% 36 to 44)) and non-punitive response to error (37.5% (CI 95% 35 to 40)), which are also below the AHRQ average (53% and 47%, respectively),<sup>69</sup> but similar

**Table 5** Multiple comparisons between professional categories in the dimensions of the Hospital Survey on Patient Safety Culture

	Mean (95% CI)	P value	Mean (95% CI)	P value	Mean (95% CI)	P value
<b>Contrasts</b>	<b>Teamwork within units</b>		<b>Expectations and actions promoting patient safety</b>		<b>Organisational learning – continuous improvement</b>	
Physician—nurse	8.8 (6.3 to 11.3)	<b>&lt;0.001</b>	4.5 (–2.4 to 11.3)	0.414	3.0 (–5.9 to –0.1)	<b>0.039</b>
Physician—multi-professional team	7.8 (0.7 to 14.8)	<b>0.023</b>	4.2 (–1.2 to 9.6)	0.236	0.6 (–4.5 to 5.7)	>0.999
Physician—others	5.8 (0.5 to 11.1)	<b>0.024</b>	3.7 (–0.9 to 8.3)	0.217	0.3 (–2.1 to 2.7)	>0.999
Nurse—multi-professional team	1.0 (–5.6 to 3.5)	>0.999	0.3 (–2.8 to 2.3)	>0.999	3.6 (0.6 to 6.6)	<b>0.010</b>
Nurse—others	3.0 (–8.5 to 2.5)	0.576	0.8 (–7.6 to 6.0)	>0.999	3.3 (–1.0 to 7.6)	0.226
Multi-professional team—others	2.0 (–10.1 to 6.2)	>0.999	0.5 (–6.5 to 5.5)	>0.999	0.3 (–5.9 to 5.3)	>0.999
	<b>Management support for patient safety</b>		<b>Feedback and communication about errors</b>		<b>Frequency of events reported</b>	
Physician—nurse	3.5 (–2.5 to 9.5)	0.641	10.6 (–15.2 to –6.0)	<b>&lt;0.001</b>	9.7 (–14.2 to –5.3)	<b>&lt;0.001</b>
Physician—multi-professional team	2.8 (–2.8 to 8.4)	0.687	4.1 (–9.7 to 1.6)	0.213	4.0 (–8.3 to 0.3)	0.082
Physician—others	0.3 (–1.4 to 0.9)	0.723	4.2 (–7.4 to –0.9)	<b>0.006</b>	8.6 (–16.2 to –1.1)	<b>0.017</b>
Nurse—multi-professional team	0.7 (–2.5 to 1.0)	0.723	6.5 (1.4 to 11.5)	<b>0.006</b>	5.8 (1.3 to 10.2)	<b>0.005</b>
Nurse—others	3.8 (–9.3 to 1.7)	0.405	6.4 (3.4 to 9.3)	<b>&lt;0.001</b>	1.1 (–1.8 to 4.0)	0.453
Multi-professional team—others	3.1 (–8.7 to 2.6)	0.687	0.1 (–5.8 to 5.6)	0.975	4.7 (–11.6 to 2.3)	0.267
	<b>Overall perceptions of patients' safety</b>		<b>Communication openness</b>		<b>Teamwork across units</b>	
Physician—nurse	10.1 (0.0 to 20.1)	0.051	7.9 (–1.4 to 17.1)	0.137	11.5 (3.6 to 19.5)	<b>0.001</b>
Physician—multi-professional team	7.6 (1.8 to 13.5)	<b>0.004</b>	9.8 (0.4 to 19.3)	<b>0.038</b>	8.0 (–0.3 to 16.3)	0.065
Physician—others	7.4 (5.8 to 9.0)	<b>&lt;0.001</b>	8.4 (0.8 to 16.0)	<b>0.021</b>	7.3 (4.8 to 9.8)	<b>&lt;0.001</b>
Nurse—multi-professional team	2.4 (–8.3 to 3.5)	0.987	2.0 (–0.9 to 4.8)	0.289	3.6 (–8.2 to 1.1)	0.201
Nurse—others	2.7 (–10.7 to 5.3)	0.987	0.6 (–5.7 to 6.8)	>0.999	4.2 (–10.6 to 2.2)	0.275
Multi-professional team—others	0.3 (–3.9 to 3.3)	0.987	1.4 (–10.0 to 7.1)	>0.999	0.7 (–7.6 to 6.3)	0.854
	<b>Staffing</b>		<b>Handoffs and transitions</b>		<b>Non-punitive response to error</b>	
Physician—nurse	5.8 (–1.8 to 13.3)	0.200	1.7 (–6.7 to 10.2)	>0.999	6.7 (–5.3 to 18.7)	0.750
Physician—multi-professional team	10.8 (7.0 to 14.7)	<b>&lt;0.001</b>	3.0 (0.7 to 5.2)	<b>0.004</b>	9.5 (1.1 to 18.0)	<b>0.017</b>
Physician—others	7.5 (5.2 to 9.8)	<b>&lt;0.001</b>	9.2 (4.5 to 13.9)	<b>&lt;0.001</b>	3.7 (–6.6 to 14.1)	0.831
Nurse—multi-professional team	5.1 (–0.4 to 10.5)	0.080	1.2 (–5.5 to 7.9)	>0.999	2.8 (–2.9 to 8.5)	0.750
Nurse—others	1.8 (–5.4 to 8.9)	0.632	7.4 (–2.4 to 17.3)	0.214	2.9 (–15.4 to 9.5)	0.831
Multi-professional team—others	3.3 (–7.9 to 1.2)	0.200	6.2 (1.7 to 10.8)	<b>0.002</b>	5.8 (–16.6 to 5.0)	0.750

Bold: significant p value.

to the Latin American PSC review (39% and 33%, respectively).<sup>70</sup> The non-punitive response to the error dimension has also been reported as the most critical dimension in other Brazilian reports<sup>43</sup> and international reviews.<sup>74</sup>

Interestingly, these two dimensions plus communication openness represented the wider differences across healthcare workers in a leadership position, especially the punishment to error (variation of 16.7 percentage

point (95% CI 9 to 24], p value <0.001). This variation in the perception may be related to the distance between leaders and the front line, often perceived in current management models and leadership perception.<sup>75 76</sup>

Compared with the American benchmark, our fair culture appears among 10% of the worst hospitals, evidencing that it is still an unaddressed issue in the Latin American context. The dimension of non-punitive response to error is a concern in our sample and one of the greatest challenges worldwide.<sup>74 77</sup> A systematic review involving 21 countries showed a lack in applying fair culture algorithms, developing psychological safety and sharing lessons learnt.<sup>15</sup> According to Reason,<sup>78</sup> 90% of errors are blameless, but we reinforce the challenge of promoting fair culture flows regardless of the type of event to improve quality, patients' outcomes and patients' experience, which all are directly associated with PSC.<sup>79 80</sup>

### Others findings

All mean scores were higher for health workers in leadership positions, except for hospital handoffs and transitions. Although leaders' support and leadership abilities are crucial in this dimension,<sup>81 82</sup> this result may be explained by the fact that leaders usually work on a fixed schedule rather than rotating shifts in the participating institutions in our sample.

In contrast to other reports,<sup>9 74</sup> we did not find differences between nurses and other healthcare professionals regarding punitive culture (p value >0.05 for all). Since women working in developing countries often experience gender inequality and discrimination, the punitive culture perceived by women nurses may result from hospitals being gendered organisations.<sup>83 84</sup> Machismo culture, paternalistic leaders and medicalised systems may also contribute to these findings in Latin America.<sup>9</sup> Establishing a non-punitive culture with open communication is essential to cultivate a robust incident reporting system and facilitating adverse event disclosure.<sup>85</sup> As no significant differences among professional categories were found in our sample, we may hypothesise that this is an addressed issue in the participating hospitals. However, further studies are necessary to confirm this speculation.

Additionally, in these two dimensions, nurse scores were higher when compared with other categories (*P*-value <0.05 for all), which may be justified because nurses are more engaged in improvement and care processes. In contrast, physicians and other professionals are more involved in clinical assistance issues than administrative routines. As PSC is the responsibility of all professionals involved in healthcare, engaging the medical team in matters of quality and patient safety is crucial to improve safety outcomes.<sup>86</sup> It is expected from organisations with a strong safety culture that their perception is common to all employees and that their values are applied in daily practice.<sup>78 77 88</sup>

### The COVID-19 pandemic's impact in the PSC

Notably, this study was conducted during the COVID-19 pandemic period, when there was a significant drop in the PSC survey scores worldwide between 2019 and 2021.<sup>89</sup> These findings raised a point of concern, evidencing how our healthcare systems are not resilient enough to confront significant challenges such a pandemic, being necessary numerous advancements and invest, especially in areas of risk management and contingency planning to achieve better safe care outcomes.<sup>90</sup> Recently, a crisis response strategy has been proposed to positively change the safety climate attitudes after the pandemic.<sup>91</sup>

Although staffing shortages are a known issue in Latin America<sup>92</sup> the COVID-19 pandemic exacerbated it.<sup>93</sup> In this context, staffing issues—reported here as one of the worse scores (40.2% (CI 95% 36 to 44))—may also influence our results since the perception of patient safety has been related to the availability of appropriated staffing,<sup>94</sup> and it is essential for achieving more favourable PSC.<sup>95</sup> Here, the multidisciplinary team scored less positively in the work overload item, which may be justified by overwork during a pandemic. Pitfalls related to staffing, work pressure and overload affecting PSC have also been observed in other studies during the COVID-19 outbreak.<sup>96 97</sup> Furthermore, infrastructure has been identified as a potential new PSC dimension.<sup>97</sup>

Some regional studies assessing PSC were reported during the pandemic (all from Brazil). However, they also presented similar limitations, as previously mentioned, mainly related to their application in a single unit,<sup>98 99</sup> comparing single units within the same institution.<sup>100 101</sup>

### Limitations

The current report is not exempt from limitations. Although a new version of the HSOPSC is available (V.2.0),<sup>6</sup> to the best of our knowledge, there are no Latin American studies using a translated version. A validated HSOPSC in the Portuguese language is still under assessment,<sup>102</sup> and, therefore, a unified measurement of South American countries, including Brazilian institutions, as reported here would not be possible. Moreover, larger and more detailed evidence of HSOPSC V.1.0 in a Latin American setting is recommended before migration to V.2.0.<sup>9</sup>

Since the healthcare workers of the participating institutions are voluntary submitters, are not a random sample, and only four institutions were included, these results may not be representative of all Latin American healthcare institutions. Additionally, the studied hospitals are recognised as the best in Latin America with international accreditation, which is strongly associated with PSC.<sup>103</sup> A broader vision, including non-accredited hospitals and institutions with lower resources, would be desirable to have a more reliable vision of local PSC.

We discussed some points regarding the lack of a Latin American PSC benchmark using the AHRQ report.<sup>69</sup> The American baseline would be more suitable for Western culture, while other reports, such as Europeans, Asians



and Africans, could bring other cultural divergences that may influence our comparison. Notwithstanding, the comparison with the AHRQ should be interpreted carefully, mainly because of the sample size (630 vs four hospitals) and application period (2018 vs 2021). In this context, a Brazilian report<sup>70</sup> conducted in the same year may be comparable to our sample. These limitations highlight the need for Latin American benchmarks.

A recent study found significant differences in perceptions of PSC by race and gender, showing that participants who identified as black/African American, Native Hawaiian, two or more races or 'other' had a worse perception on all dimension questions about safety culture and event reporting.<sup>104</sup> Thus, we reinforce the relevance of collecting data such as ethnicity and gender to analyse equity in the perception of participating professionals.

We characterised analyses through the formal position occupied by the professional, however, the analysis of local microcultures through the influence of informal leaders was not possible to evaluate through the survey used. Different perceptions of PSC may be found in similar units and under the same management, reinforcing the existence of local microcultures.<sup>105</sup> Further studies are necessary to address this subject in Latin American hospitals.

### Prospective

ALIS is encouraged to continue monitoring PSC, expand the measures to other Latin American countries, drive collective actions to improve the areas with the greatest opportunity and also ensure the maintenance of their dimensions recognised as strong in the current survey applied.

### CONCLUSION

The present study showed that Latin America has developed a strengthened culture of safety care. Nevertheless, there are still opportunities for improvement, especially in areas such as a fair culture and strengthening equity between different professional categories. Although the contexts of the participating countries are different, the dimensions understood are similar, demonstrating that it is possible to build joint actions to change this scenario.

Our results may help other local hospitals identify common PSC strengths and weaknesses, compare PSC perceptions with other regional hospitals and guide applied research to implement strategies focused on improving safety culture. Finally, our findings may inform health policies focused on advancing safety culture and guide international accreditation organisations in PSC assessments in Latin American hospitals.

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