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Are Spanish primary care professionals aware of patient safety?

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Background: Knowledge about safety culture improves patient safety (PS) in health-care organizations. The first contact a patient has with health care occurs at the primary level. We conducted a survey to measure patient safety culture (PSC) among primary care professionals (PCPs) of health centres (HCs) in Spain and analyzed PS dimensions that influence PSC. **Methods:** We used Agency for Healthcare Research and Quality (AHRQ) Medical Office Survey on Patient Safety Culture translated and validated into Spanish to conduct a cross-sectional anonymous postal survey. We randomly selected a sample of 8378 PCPs at 289 HCs operated by 17 Regional Health Services. Statistical analysis was performed on sociodemographic variables, survey items, PS dimensions and a patient safety synthetic index (PSSI), calculated as average score of the items per dimension, to identify potential predictors of PSC. We used AHRQ data to conduct international comparison. **Results:** A total of 4344 PCPs completed the questionnaire. The response rate was 55.69%. Forty-two percent were general practitioners, 34.9% nurses, 18% administrative staff and 4.9% other professionals. The highest scoring dimension was 'PS and quality issues' 4.18 (4.1–4.20) 'Work pressure and pace' was the lowest scored dimension with 2.76 (2.74–2.79). Professionals over 55 years, with managerial responsibilities, women, nurses and administrative staff, had better PSSI scores. Professionals with more than 1500 patients and working for more than 11 years at primary care had lower PSSI scores. **Conclusions:** This is the first national study to measure PSC in primary care in Spain. Results may reflect on-going efforts to build a strong PSC. Further research into its association with safety outcomes and patients' perceptions is required.

Introduction

Patient safety (PS) is a key aspect of health-care quality, having taken on major importance in recent years for health-care professionals, who want to provide safe, effective and efficient health care for patients and their families, who also want to feel safe and confident about the health care provided.[1] Health-care organizations are becoming aware of the importance of transforming organizational culture among their professionals in order to improve PS because health-care organizations reach a high level of quality and PS through them.[2]

The most common definition for the safety culture of an organization is the product of individual and group values, attitudes, perceptions, competencies and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organization's health and safety management. Organizations with a positive safety culture are characterized by a communication founded on mutual trust, by shared perceptions of the importance of safety and by the efficacy of preventive measures.[3] A number of authors[4] emphasize the difference between safety climate (individuals' attitudes towards safety) and safety culture as a concept involving several dimensions such as overall commitment to quality, priority given to PS, perceptions of the causes of PS incidents and their identification, investigating PS incidents, organizational learning about PS issues, communication about safety issues, personnel management and safety issues, staff education and training about safety and team work around safety issues, taking into account that climate is able to measure safety culture when using surveys.

In the European Union, where protection of human health is an obligation for member states,[5] countries have been encouraged to take actions to include PS as priority issue in public health policies,[6] empowering patients and promoting PSC among health professionals, appropriate training and possibility of learning from errors.[7]

The Spanish Ministry of Health, Social Services and Equality (SMH), in light of its responsibility for improving the quality of the health system overall, has been developing in coordination with the Spanish regions, a national strategy whose first objective is to promote PSC among professionals and patients.[8] In this context, a study of the prevalence of adverse events (AEs) in primary care was performed in 2007, APEAS (National Study of Patient Safety in Primary Health Care in Spain),[8] in which the prevalence of AEs was 11.18‰ consultations [95% confidence interval (CI) 10.52–11.85]. Most AEs (64.3%) were considered preventable, and only 5.9% were severe, usually related to medication [odds ratio (OR) 4.6, 95% CI 2.1–10.3]. The most frequent causal factor for AEs was associated with medication (adverse drug reactions and medication errors), but problems in communication, management and other organizational factors were at the root of

many of the AEs as in hospital care.[9] Nurses reported more preventable AEs (OR 1.9, 95% CI 1.2–2.8) than doctors.

The Spanish National Health System (SNS)[10] is an organization comprising 18 health-care systems: 17 regional systems and 1 for 2 autonomous cities (Ceuta and Melilla). These regional systems are coordinated by the Inter-territorial Health Council headed by the SMH. Each regional system is organized into health areas (HA) or districts. An HA has several health centres (HCs) and at least one tertiary referral hospital. An HC is a clinic staffed by a group composed of family physician, paediatricians nurses, nursing assistants and administrative staff. Some also offer midwifery, physiotherapy and dental services. HCs are owned by the regional health authority, which assigns each one to a geographical district. Residents of the district register as patients with a general practitioner. Patients contact the HC for an appointment, whether scheduled or urgent, or for a referral to specialists. There is a gatekeeping system in place. Family physicians may care for patients in the HCs, 'at patients' home' or other health-care facilities providing continuing care to the patients and referring them to a more specialized level if needed. Primary care professionals (PCPs) working at an HC are normally employed with the status of civil servants, although they share a population management contract linked to economic incentives with regional health authorities. Each HC has a multidisciplinary team consisting of a physician, a nurse and an administrative officer, which organizes the activities. These professionals are known as 'coordinators', but they do not have legal or economic responsibilities over others in most of the regions. The health authority pays the salaries of all staff, and provides the supplies and maintenance for the HC and Clinical Electronic Records. The Spanish system of primary care organization differs from that of other countries such as the United States,[11] France, Belgium, Germany,[12] and the Netherlands,[13] where there are still considerable numbers of single practitioners.

Although safety culture was evaluated in different clinical settings in Spain and in other European countries,[14–16] very little research have been performed in primary care regarding this issue.[17,18]

The aim of this study is to measure PSC among PCPs working in public HCs, to describe results and to provide new proposals to improve PSC in primary care.

Methods

We conducted a cross-sectional survey to measure PSC on PCPs to work in public HCs in Spain.

Population

PCPs work at public HCs with direct face-to-face patient contact in any of the Spanish regional health-care systems. Medical or nurse students were excluded.

Stratified sampling was performed considering the 17 regional health systems. Then, a simple random sampling was performed within each regional system in order to select the participating HCs and professionals within centres. The unit of analysis is each professional who participate in the survey.

The sample size has been calculated considering a target population of 85 000 PCPs working in 2922 HCs, with an accuracy of 0.1, a CI of 95%, standard deviation of 2.3 from a pilot study,[18] a design effect of 2.5 and sampling with 40% replacement. Once the sample has been selected, we consider 10 HCs for the smaller regions so that the study would be useful at each regional level. So the final sample consisted of 289 HCs and 8378 PCPs.

Questionnaire

We used the Agency for Healthcare Research and Quality (AHRQ) Medical Office Survey on Patient Safety Culture,[19] translated and validated into Spanish.[20] The Spanish version includes six more questions for the purpose of obtaining specific information from health-care professionals in three specific dimensions: staff training, office processes and standardization and communication about error.

The questionnaire has 67 items, grouped in 9 sections, covering 15 dimensions. A brief description for each dimension is shown in table 1. There is a section to collect an overall perception of PSC from PCPs containing two items: G1, which rates the HC by considering whether it is patient oriented and delays, efficiency and fairness; and G2, which requests an overall self-assessment score on PS. The questionnaire also includes a section to collect information on age, sex, professional category, number of patients assigned, years of work in primary care and out-of-hours work.

To facilitate international comparisons with AHRQ data, answer categories were operationalized in a similar way from five or six categories to three levels: negative, positive or neutral. The questionnaire was edited in the TeleForm System so as to be automatically read and to avoid transcription errors.

We calculated a patient safety synthetic index (PSSI) for each dimension which represents the average score of the items in each dimension and an overall PSSI to show global perception of PS for each professional and HC as the composite result of scores in the 15 dimensions. In all items, the range is 1–5. In addition, the percentage of professionals with positive (PSSI > 3) or very positive perception (PSSI > 4) was calculated for each dimensions, as in AHRQ questionnaire.[21]

In order to enhance participation, we sent a kit to each HC consisting of a cover letter from the senior PS officer at the SMH, a slide presentation and the TeleForm questionnaires. Regional PS coordinators encouraged participation, which we also did through personal contact with medical coordinators in HCs. The survey took place between June 2011 and December 2011.

Participation in the survey was voluntary. Because this kind of study did not require review by an ethics review board in Spain, no ethical approval was requested after discussion of the issue with the institutional review board.

Statistical analysis

A descriptive analysis was performed for all variables and dimensions, which consisted of frequency distribution for qualitative variables, and means and standard deviations (SD) for quantitative data.

The percentage of professionals with positive (PSSI > 3) or very positive perception (PSSI > 4) was calculated for each dimension, as in AHRQ questionnaire. Pearson's correlation coefficient was used to measure the relationship between quantitative sociodemographic variables and PS dimensions, and quantitative variables were compared with Student's *t*-test or analysis of variance with the Bonferroni correction method when several categories were used. Different logistic regression models were performed to identify factors associated with a positive perception of PS among PCPs. The dependent variables selected for the analysis were as follows: PSSI >3 and PSSI >4 or G2 (overall self-assessment score for PS) >3 and >4. We used AHRQ 2012 data[22] for international comparison of data. The data were analyzed using the SPSS version 18.0 statistical package (SPSS, Inc., Chicago, IL).

We have used AHRQ analysis tool to compare AHRQ data 2012 with our data. We have returned a report to each participating centre comparing HC data with Spanish national data and AHRQ data 2012.

Results

Fifteen of the 17 regions took part in the study. Two regional authorities refused to participate. After deducting the HCs of these regions, 215 of the 245 (87.8%) HCs participated in the study. A total of 4344 (56.2%) staff professionals answered the questionnaire. The average age was 47.0 years (SD 9.1) and 70.7% were women.

Table 1 Positive percentage by dimension and overall rating on patient safety compared with 2012 AHRQ Medical Office Survey

Patient safety dimensions (questions in each dimension)		Dimensions' description	Spanish data % positive	AHRQ 2012 % positive
D1	Patient safety and quality issues (A1 A2 A3 A4 A5 A6 A7 A8 A9)	Events that can happen in HCs that affect patient safety and quality of care	73	80
D2	Information exchange with other settings (B1 B2 B3 B4)	Problems exchanging accurate, complete, and timely information with other health providers (e.g. pharmacies, etc.)	61	77
D3	Teamwork (C1 C2 C5 C13)	Good working relationships and respect	74	84
D4	Work pressure and pace (C3 C6 C11 C14)	Impact of oversights and work load	36	46
D5	Non–health-care staff training (C4 C7 C10) Health-care staff training (C16 C17 C18)	Guarantee that workforce is trained on their tasks	58	73
D6	Office processes and standardization for non–health-care staff (C8 C9 C12 C15) Office processes and standardization for health-care staff (C8 C9 C12 C19)	Processes and standardization of tasks	59	64
D7	Communication openness (D1 D2 D4 D10)	Professionals share ideas, viewpoints and disagreement with respect	59	64
D8	Patient care tracking/follow up (D3 D5 D6 D9)	Professionals follow-up patients and remind patients' tasks	77	82
D9	Communication about error. Non–health-care staff (D7 D8 D11 D12) Communication about error. Health-care staff (D13 D8 D11 D14)	Professionals open disclose and discuss to prevent errors	63	66
D10	Leadership support for patient safety (E1 E2 E3 E4)	Perception about the support on patient safety and quality issues from managers of HCs	61	67
D11	Organizational learning (F1 F5 F7)	Learning experience from errors in the HCs	76	77
D12	Overall perceptions of patient safety and quality (F2 F3 F4 F6)	Professional self-assessment on patient safety and quality issues in HC	70	76
G2	Overall rating on patient safety (G2)	Professional self-assessment on patient safety in HC	34	67

D = dimension.
Notes: Definitions available at: Dimension content: items and dimensions: survey user's guide: Medical Office Survey on Patient Safety Culture. October 2014. Agency for Healthcare Research and Quality, Rockville, MD (http://www.ahrq.gov/professionals/quality-patient-safety/patientsafetyculture/medical-office/userguide/medoffitems.html).

General practitioners comprised 42%, nurses made up to 34.9%, 18% were non–health-care professionals and 4.9% were allied health-care professionals (midwives, dentists, social workers, physiotherapists). HC management comprised 8.8%, of whom 45.3% were doctors, 35.6% nurses and 19.1% administrative staff. Seventy percent of participants have been working at the same HC for more than 6 years and 84.2% work from 33 to 40 hours/week. The average number of patients registered with a family doctor ranged between 1500 and 2000 patients (43.5%), and 13.8% of doctors had been assigned more than 2000 patients.

The PSSI (table 2) score was 3.72 (95% CI 3.70–3.73) and the overall self-assessment score for PS was 3.25 (95% CI 3.23–3.28). Women had a better perception (PSSI 3.74, 95% CI 3.72–3.75) than men (PSSI 3.69, 95% CI 3.66–3.72).

'Work pressure and pace' is the lowest scoring dimension, with a value of 2.76 (95% CI 2.74–2.79) and 'PS and quality issues' was the highest, with a value of 4.18 (95% CI 4.16–4.20). These scores were similar for both men and women, and for the three age groups.

Non–health-care staff training was the second lowest scoring dimension with a value of 3.18 (95% CI 3.10–3.25) for staff themselves, but the values scored by doctors and nurses were 3.54 (95% CI 3.49–3.58) and 3.59 (95% CI 3.54–3.64), respectively. However, 'healthcare staff training' was very positively scored by non-healthcare staff, with a value of 3.69, and by nurses, with a value of 3.56, but doctors scored it lower, with a value of 3.37.

Considering professional categories (table 3), the PSSI score for nurses was 3.76 (95% CI 3.73–3.78), 3.69 for general practitioners (95% CI 3.67–3.71) and 3.64 for non–health-care staff (95% CI 3.60–3.67). The PSSI by age group (table 2) showed that the best perception was for the 56–69 year age group (3.76; 95% CI 3.73–3.80), the second was the group of PCPs under the age of 41 years (3.74; 95% CI 3.71–3.74), and there was a significant difference ($P < 0.01$) for the 41–55 year age group (3.70; 95% CI 3.68–3.72).

Professionals with management responsibilities (table 3) showed a PSSI score of 3.84 (95% CI 3.80–3.88), higher than 3.70 (95% CI 3.68–3.71) obtained by the rest of participants.

Health-care professionals who were assigned fewer than 1000 patients had a higher PSSI score of 3.82 (95% CI 3.78–3.87) than those with 1000–1500 patients with a PSSI score of 3.74 (95% CI 3.71–3.77). The lowest PSSI score was for those who were assigned more than 1500 patients, with a value of 3.66 (95% CI 3.64–3.69). Health-care professionals with fewer than 1000 registered patients scored over 3.80 in 8 dimensions; those with 1000–1500 patients did so in 6 dimensions and those with more than 1500 patients did so in 4 dimensions.

Professionals who were temporary employees had a higher PSSI score (3.80; 95% CI 3.76–3.84) than those who were full-time employees (3.69; 95% CI 3.67–3.70) or full-time employees enjoying permanent civil servant status (3.73; 95% CI 3.70–3.77). The PSSI score for professionals who work out of hours (3.76; 95% CI 3.73–3.78) was higher than that of staff who did not work out of hours (3.68; 95% CI 3.66–3.70). To work for more than 11 years in an HC reduces by 37% (OR 0.63, 95% CI 0.43–0.92) the positive perception of PS, compared with the group of professionals who have worked less than a year in primary care

Table 1 shows the comparative results of Spanish data, using AHRQ analysis tool, with AHRQ database (2012). Most respondents in AHRQ 2012 gave their medical office an Average Overall PS rating of excellent and very good (67%), while in the Spanish study the score was 34%. Work pressure and pace have the lowest average percent of positive responses in both AHRQ (46%) and Spain (36%).[22] A comparison of dimensions shows lower scores for Spanish professionals, which were generally positive, but not

Table 2 PSSI per dimensions and overall scores by sex

Patient safety dimensions (questions in each dimension)	All Mean (95% CI)	Men Mean (95% CI)	Women Mean (95% CI)	*P* value[a]
Patient safety and quality issues (A1 A2 A3 A4 A5 A6 A7 A8 A9)	4.18 (4.16–4.20)	4.18 (4.15–4.22)	4.20 (4.18–4.22)	NS
Information exchange with other settings (B1 B2 B3 B4)	3.96 (3.93–3.99)	3.89 (3.83–3.94)	3.99 (3.95–4.03)	0.005
Teamwork (C1 C2 C5 C13)	3.90 (3.87–3.92)	3.86 (3.80–3.92)	3.96 (3.92–4.00)	NS
Work pressure and pace (C3 C6 C11 C14)	2.76 (2.74–2.79)	2.70 (2.63–2.76)	2.77 (2.72–2.81)	0.05
Non–health-care staff training (C4 C7 C10)	3.48 (3.45–3.51)	3.43 (3.37–3.49)	3.54 (3.49–3.58)	0.05
Health-care staff training (C16 C17 C18)	3.49 (3.46–3.51)	3.40 (3.34–3.46)	3.53 (3.49–3.57)	0.005
Office processes and standardization for non–health-care staff (C8 C9 C12 C15)	3.45 (3.43–3.48)	3.40 (3.34–3.46)	3.47 (3.43–3.51)	NS
Office processes and standardization for health-care staff (C8 C9 C12 C19)	3.50 (3.48–3.52)	3.43 (3.38–3.49)	3.54 (3.51–3.58)	0.05
Communication openness (D1 D2 D4 D10)	3.65 (3.63–3.67)	3.63 (3.58–3.69)	3.71 (3.67–3.74)	NS
Patient care tracking/follow up (D3 D5 D6 D9)	4.00 (3.97–4.02)	3.90 (3.85–3.96)	4.02 (3.99–4.06)	0.001
Communication about error. Non–health-care staff (D7 D8 D11 D12)	3.76 (3.73–3.78)	3.71 (3.66–3.77)	3.77 (3.73–3.81)	NS
Communication about error. Health-care staff (D13 D8 D11 D14)	3.81 (3.79–3.83)	3.75 (3.70–3.81)	3.84 (3.81–3.88)	NS
Leadership support for patient safety (E1 E2 E3 E4)	3.57 (3.55–3.60)	3.54 (3.48–3.60)	3.64 (3.60–3.68)	0.01
Organizational learning (F1 F5 F7)	3.83 (3.81–3.85)	3.76 (3.70–3.81)	3.84 (3.81–3.88)	0.001
Overall perceptions of patient safety and quality (F2 F3 F4 F6)	3.71 (3.69–3.74)	3.64 (3.59–3.69)	3.73 (3.69–3.77)	0.001
Overall scores				
Overall score on quality (G1A G1B G1C G1D G1E)	3.42 (3.40–3.44)	3.47 (3.43–3.51)	3.41 (3.38–3.43)	0.01
Overall score on patient safety (G2)	3.25 (3.23–3.28)	3.25 (3.20–3.30)	3.27 (3.23–3.30)	NS
PSSI	3.71 (3.70–3.73)	3.68 (3.65–3.71)	3.73 (3.71–3.74)	0.01

NS = not significant.
a: *P* value of men and women comparisons.

Table 3 Overall scores by professions, management responsibilities and age groups

Overall scores on quality and patient safety	Doctors Mean (95% CI)	Nurses Mean (95% CI)	Non–health-care staff Mean (95% CI)	*P* value
Overall quality scores (G1A G1B G1C G1D G1E)	3.47 (3.44–3.50)	3.41 (3.37–3.44)	3.34 (3.28–3.39)	0.001 D: NS
Overall patient safety scores (G2).	3.22 (3.18–3.26)	3.27 (3.22–3.31)	3.30 (3.24–3.37)	NS
PSSI	3.69 (3.67–3.71)	3.76 (3.73–3.78)	3.64 (3.60–3.67)	0.001 D: NS
	Management responsibilities Mean (95% CI)	**Non-management responsibilities Mean (95% CI)**		
Overall quality scores (G1A G1B G1C G1D G1E)	3.60 (3.54–3.66)	3.41 (3.39–3.43)		0.001
Overall patient safety scores (G2).	3.39 (3.31–3.47)	3.24 (3.21–3,27)		0.005
PSSI	3.84 (3.80–3.88)	3.70 (3.68–3.71)		0.001
	20–40 years Mean (95% CI)	**41–55 years Mean (95% CI)**	**56–69 years Mean (95% CI)**	
Overall score on quality (G1A G1B G1C G1D G1E)	3.46 (3.42–3.50)	3.43 (3.40–3.46)	3.43 (3.38–3.48)	NS
Overall score on patient safety (G2).	3.31 (3.26–3.36)	3.24 (3.20–3.27)	3.29 (3.23–3.34)	0.03
PSSI	3.74 (3.71–3.76)	3.70 (3.68–3.72)	3.76 (3.73–3.80)	0.01 AB–CA[a]

D = doctors; N = nurses; S = non–health-care staff. There is a statistically significant difference between groups separated by dashes.
a: A = 20–40 years; B = 41–55 years; C = 56–69 years. There is a statistically significant difference between groups AB and CA.

very positive. All positive percentage in each dimension of Spanish data is lower than those from AHRQ data. The smallest difference was in 'organizational learning and communication about error', with less than 5%.

Regarding logistic regression models considering overall perception on PS (G2) (table 4), there is a clear relationship with leadership, employment status and professionals who cover out of hours. Age and sex have a significant relationship with a positive perception. Leaders have a 40% more probability to rate a very positive perception (G2 $\geq$4) than the rest. Professionals who work per hours or do out of hours have a 30% and 25% probability of having a very positive perception (G2 $\geq$4) respectively, than the rest.

Discussion

This study shows the PS perception of a representative sample of PCPs working in the SNS. The PSC in Spanish HCs as perceived by professionals is generally positive.

One limitation of a self-assessment questionnaire is that it can be biased owing to staff suffering from burnout or being overly optimistic. Another one is that the health authorities of two regions refused to participate. It was a political decision to stay out of the study and they only represented 8.9% of the estimated sample and the PCP profiles were similar to the rest. Nonetheless, we believe that the sample size and representativeness compensate for any such bias.

The two overall scores from the survey—PSSI and G2 items—show a positive PS perception among PCPs similar to other studies on PS climate in primary care.[23,24] Despite the different survey instruments, meaning that the results are not strictly comparable, this consistency is remarkable. In addition, every dimension of the survey showed a positive perception, except work pressure and pace. These results are very similar to AHRQ 2012 report[22] and to other studies in primary care.[17,25]

Seventy percent of participants were women, and it represents the process of feminization of SNS workforce in Spain.[26] Regarding differences by sex, women had higher PSSI than men, which can be explained because female primary care physicians engage in more communication, which can be considered patient centred, and have longer visits than their male colleagues.[27,28]

Table 4 Predictive variables regarding positive and very positive scores for overall rating on patient safety and PSSI at HCs in logistic regression models

Dependent variable	Score in G2 ≥ 3		Score in G2 ≥ 4		Score in PSSI > 3		Score in PSSI ≥ 4	
Explanatory variables	**OR multivariate (95% CI)**	***P* value**	**OR multivariate (95% CI)**	***P* value**	**OR multivariate (95% CI)**	***P* value**	**OR multivariate (95% CI)**	***P* value**
Age (years)			[a]					
41–55[b]	1				1		1	
20–40	1.12 (0.85–1.48)	0.409			1.41 (0.84–2.41)	0.198	1.01 (0.77–1.32)	0.947
56–69	1.65 (1.20–2.26)	0.002			1.88 (1.15–3.07)	0.013	1.73 (1.32–2.27)	0.000
Sex			[a]					
Men[b]	1				1		1	
Women	1.29 (1.03–1.61)	0.027			1.43 (1.00–2.05)	0.051	1.39 (1.10–1.76)	0.006
Leadership								
No[b]	1		1		1		1	
Yes	1.55 (1.09–2.20)	0.015	1.45 (1.17–1.80)	0.001	2.53 (1.16–5.51)	0.019	1.98 (1.44–2.73) [a]	0.000
Employement status								
Civil servants[b]	1		1		1			
Salaried	1.12 (0.84–1.50)	0.441	1.08 (0.89–1.30)	0.441	1.30 (0.76–2.21)	0.337		
Per hours	1.67 (1.13–2.46)	0.010	1.33 (1.08–1.65)	0.008	3.24 (1.24–8.46) [a]	0.016		
Out-of-hours cover								
No[b]	1		1				1	
Yes	1.25 (1.00–1.55)	0.050	1.25 (1.08–1.45)	0.003			1.35 (1.09–1.68)	0.006
Years at work in a HC	[a]		[a]		[a]			
<1[b]							1	
1–3							0.72 (0.48–1.07)	0.107
3–6							0.75 (0.52–1.09)	0.133
6–11							0.73 (0.49–1.10)	0.130
>11							0.63 (0.43–0.92)	0.017

G2 = overall rating on patient safety. PSSI calculated as average score of items in each dimension.
a: Variables not included in the model.
b: Reference category.

PS and quality issues was the highest scoring dimension for all professional categories. This dimension considers daily tasks such as procuring an appointment for an urgent problem in less than 48 hours and providing clinical pathways for patients demanding emergency visits, among others. The next highest scoring dimensions were 'patient care tracking/follow-up, information exchange with other settings and teamwork'. These four dimensions were easier for professionals to assess because they concern usual performance, and also because they were dimensions that had been improved in the SNS during the course of the previous decade[29] with the expansion of primary care teams, electronic health records and electronic prescription in almost all HCs[30] in several regions, being connected to hospital records, and the ability to make a medical appointment via the internet, among other strategies implemented.

The most important difference between the perceptions of the different categories concerned health-care staff training. Administrative staff considered that other categories were better trained than they were, while the others perceived the contrary. This dimension was highlighted by the European Commission regarding the implementation of the Council Recommendation on PS which urges countries to invest in health-care professionals training.[31,32]

Doctors scored the dimension 'communication about error' lower than they did in other categories. Communication failures contribute to many AEs affecting PS. Consequently, research to improve the performance of teams is one of the future key actions to be taken, as described in the Delphi study conducted by World Health Organization's Safer Primary Care Expert Working Group.[33] Improving the performance of teams also contributes to the expertise gained with regard to human factors in health care,[34] and provides support when notifying PS incidents at the HC.

The underlying assumption of the human factors' perspective is that if systems (i.e. organizations and networks of organizations) and working conditions within these organizations can be optimized, then the occurrence of AEs is less likely.[35] This assumption can explain that the number of patients registered with a doctor was crucial to the work pressure and pace dimension score: the more patients registered with a doctor, the lower the PS.

Professionals with managerial responsibilities scored all PS dimensions higher than other professionals did. These results are similar to those found in secondary care.[36]

Doctors who work in a rural setting usually provide out-of-hours cover. Those who worked out of hours showed a higher perception of PS, mainly because they were more easily able to guarantee the continuity of care for patients registered with them.

Comparisons with AHRQ data show a positive perception of PS issues. Nevertheless, Spanish perceptions for all dimensions are lower. The comparisons have some limitations due to the fact that AHRQ survey is performed on a voluntary basis and is administered by different methods, only 13% of respondents are doctors while in the Spanish survey are 42% and only half of the centres (437/934) were family doctors offices.

In this study, we have identified that those PCPs who have a better perception of PS in HCs are mainly women, nurses, professionals in their fifties and those with managerial responsibilities. Consequently, there is a need for on-going work with them in order to improve perception in other professionals to make health care safer.[37]

A positive safety culture means that leaders and front staff work together to ensure care is delivered safely using different tools to identify gaps and create safer systems. Climate surveys are useful tools to monitor the attitude of the staff about safety issues and to identify areas for improvement. Our level of PS is mainly based on two dimensions: PS and quality issues and patient care tracking/follow up.

Improving and supporting PSC among professionals requires ensuring PS practices in health-care settings: the use of reporting systems to enhance organizational learning,[38] checklists[39] and medication reconciliation to prevent adverse drug events when

patients return to the community are being among the most important, as well as to reinforce the patients' role.[31]

Some proposals arise from the results of this study to improve PSC. Promoting education and training on PS for professionals as well as for patients and families improve PSC and ensure PS practices in health-care settings in an era of cost constraints.[31]

Reporting systems are the foundation of efforts to identify gaps and create safer systems, but their success is based on the development of an organizational culture that facilitates reporting, a mechanism for translating incidents into recommendations for safer care. Reinforcing dynamic reporting systems would allow moving on from a culture of blame and accountability to focus on learning to prevent errors from happening. Learning from errors is a good safety culture indicator.[40]

Measurement provides invaluable information about how PS is viewed and handled within an organization. The availability of safety climate questionnaires adapted to different languages allows comparisons between countries to know the different factors affecting the safety culture. The experiences from the validation of the questionnaires, general results obtained and actions taken to improve PSC should be shared with other MS and further research should be performed in this way.

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Conflicts of interest: None declared.

Key points

- This is the first national study to measure patient safety culture in primary care in Spain with a validated instrument that permits international comparisons. International reported perceptions on PSC in ambulatory care were generally positive as in Spain.
- Our results may reflect on-going efforts to build a strong safety culture in primary care in Spain as in other European countries.
- The significant variation in perception between certain dimensions among professionals over 55 years, with managerial responsibilities, women, nurses, administrative staff who had better PSSI scores than professionals with more than 1500 patients and working for more than 11 years at the same HC has potential safety implications and may have to be aligned for a positive and strong safety culture to be built and maintained. Further research of its association with specific safety outcomes and patients' role is required.

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A quality indicator can be biased by intra-hospital heterogeneity: the case for quality of patient record keeping in France

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Background: Since 2008, French health institutions providing medical, surgical and obstetrical care are assessed on the basis of a set of quality indicators. The French National Authority for Health developed a survey design in which 80 records are randomly selected from each institution. The main aim was to assess the effects of internal heterogeneity of a hospital that comprises several units. The survey method is based on the hypothesis of intra-institution homogeneity, which overlooks the fact that in wide hospitals homogeneity is related to departments and thus leads to overall intra-hospital heterogeneity. **Methods:** Simulated databases were created to modelise the heterogeneity of our hospital and computed to assess the reliance of indicator measurement. We used real data from a large teaching hospital having internal heterogeneity related to each department. **Results:** Variance under heterogeneity was greater than under homogeneity (3- to 18-fold) leading to an increased size of the confidence interval (CI) (at 95%) from 9 (given Haute Autorité de Santé sources) to 22 (for greatest internal heterogeneity). **Conclusions:** The variations in a quality indicator can be explained by intra-institution heterogeneity and are not related to changes in the quality policy of the hospitals and may lead to errors in terms of pay for performance.

Introduction

Since 2008, French health institutions providing medical, surgical and obstetrical care shall participate in the Indicators for Improvement of Care and Safety Quality (IPAQSS) survey, yearly. It is a retrospective survey that consisted of a collection of a set of data from which quality indicators are calculated by the French National Authority for Health (Haute Autorité de Santé—HAS), such as the patient record keeping. The hospital medical records of 80 patients are randomly selected from each institution based