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Nursing perceptions about safety culture as a local phenomenon

Short title: Nursing perceptions about safety culture

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Abstract

Background: Patient safety culture is the product of values and beliefs, attitudes, perceptions, competencies, and individual and collective behaviour patterns that determine the organisational commitment to quality and patient safety.

Aims: To determine the nursing staff perception of the institutional patient safety culture.

Methods: A cross-sectional study.

Findings: No dimension had a frequency of positive responses of 75% or higher, so we cannot classify them as strengths. Regarding the unit, we found significant differences in several dimensions.

Conclusion: Perception of nursing staff culture of safety was considered fragile, with significant differences between professional variables. Variation between different healthcare units confirms that patient safety culture is a specific local phenomenon and that it may be better to focus on improving the local culture in each unit. Our findings suggest the need to develop different strategies to improve the patient safety culture in each specific unit.

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Keywords

Cross-Sectional Studies
Nursing Staff
Organizational Culture
Patient Safety
Quality of Health Care
Safety Management

1. Background

Health care is intended to benefit people, however, in hospital and highly specialized settings it can cause harm. The complex combination of processes, technologies and human interactions that make up modern health service delivery systems achieve significant benefits even though, at the same time, they carry a risk of adverse events that occur too frequently (World Health Organization, 2021).

Patient Safety (PS) is considered today a priority in any health system. Its origin dates back to 1999, when the Institute of Medicine of the National Academy of Sciences of the United States of America (USA) published its report "To err is human: Building a safer health system". This report stated that between 44,000 and 98,000 people die each year in USA hospitals as a result of errors that could have been avoided (Kohn & Corrigan, 1999).

More recent studies conclude that there is still a high incidence of preventable deaths (3-8%), and security measures currently in place are not enough to avoid them (Hogan et al., 2014; Makary & Daniel, 2016).

The World Health Organisation (WHO) defines *patient safety* as the absence of preventable harm to a patient during the healthcare process and risk reduction of unnecessary harm associated with healthcare to an acceptable minimum. Recognising patient safety as a global health priority, in 2004, the World Health Organization launched the World Alliance for Patient Safety with the aim of coordinating, disseminating and accelerating improvements in patient safety around the world. Its creation highlights the international importance that the issue of patient safety has acquired. In May 2019, the 194 WHO member states at the 72nd World Health Assembly supported the establishment of the World Patient Safety Day, annually commemorated on September 17th (WHO, 2019).

When people consider the professionals involved in caring for patients walking through the doors of a hospital, they are usually thinking of nurses, physicians, and clinical staff. But in the process of caring for a patient, all the (visible and invisible) actors playing a role in the process of care are also involved, from administrative clerks, ancillary services staff, pharmacists, computer technicians and cleaning personnel among others. All this healthcare actors are involved and responsible for patient safety, although the role of nurses has undoubtedly a special relevance. Often their professional performance, related to activities of direct care at the bedside and their demonstrated engagement to patient safety behaviours, is transcendental to prevent errors or detect them before they cause harm to the patient, due to the place and time they occupy caring for patients (Wakefield, 2010).

Nurses remember the words frequently dictated by Florence Nightingale: "First do not hurt [the patient]". Reflecting on the fundamentals of good nursing, Nightingale had no doubt that the moral, professional, and individual responsibility of nurses was to ensure that patients did not suffer unintentional harm during care (Malone, 2004). We also know that Nightingale's

understanding of patient safety extended well beyond the individual behaviour, knowledge, and skill of the nurse (Young et al., 2011), probably referring to what a century later has been defined as patient safety culture (PSC).

Thus, PSC is the product of values and beliefs, attitudes, perceptions, competencies, and individual and collective behaviour patterns that determine the organisational commitment to quality and patient safety (Joint Commission, 2018). For the nursing profession, PSC is the result of shared values and beliefs about patient safety that surge from the dynamic interaction among people, tasks, and systems (Feng et al., 2008). Authors such as Aiken et al. (2017) have shown that hospitals with a higher nursing rate perform better in patient safety, and patient mortality probability increases in relation to the average workload per nurse in the hospital (Diya et al., 2012; Aiken et al., 2017)

Organisations with a positive PSC establish communications based on mutual trust, show shared perceptions of the importance of safety, and have clear confidence in the effectiveness of the preventive measures (Halligan & Zecevic, 2011). At the global (WHO, 2019), national (Estrategia de Seguridad del Paciente del Sistema Nacional de Salud, 2015), and regional (Gencat, 2015) levels, multiple strategies have been developed with the objectives to promote and improve PSC in health organizations, incorporate health risk management, train professionals and patients in basic aspects of patient safety, and implement safe practices involving patients and citizens.

Governments, organisations, and institutions have invested enormous financial, personnel, and time resources to establish incident-reporting systems to identify and remediate threats to patient safety (Dovey & Wallis, 2011). Incident reporting makes it easier to identify preventable problems and improve patient safety (Beckmann et al., 2003). Reporting errors in a notification system is not enough to improve patient safety if other intrinsic aspects of patient safety are lacking, such as learning and resilience (Guttman, 2019). Success of an incident-reporting system in promoting a culture of safety is achieved through staff feeling supported to identify and report errors without threat of punitive action or blame, feedback in communication, and an environment of sensitive and confidential learning. This, in turn, increases staff engagement with error reporting (Howell et al., 2015; Rea & Griffiths, 2016).

Multiple tools have been developed to evaluate PSC (The Health Foundation of UK, 2011) with the purpose of understand the weaknesses that generate risks in patient safety. Knowing these weaknesses makes it possible to establish interventions and improvements in quality of care, promoting safer care (Okuyama et al., 2019). The US Agency for Healthcare Research and Quality (AHRQ, 2020) developed one of the most widely used tools worldwide, the Hospital Survey on Patient Safety Culture (HSOPSC). This hospital survey assesses PSC at the individual, unit, and organisational levels. It is also useful to compare the culture between different industries and countries, suggesting a certain degree of external reliability (Waterson et al., 2019). Multiple hospitals around the world have used it to assess the staff perception of the organisational PSC (Roqueta et al., 2011; Sarac et al., 2011; Vlayen et al.,

2012; Castañeda-Hidalgo et al., 2013; Wang et al., 2014; Toro Blanch et al., 2015).

Our institution has participated in a variety of patient safety programmes aligned with the Government’s strategic patient safety plan, guided by the criteria and principles of the Model of Excellence of the European Foundation for Quality Management (EFQM, 2019). Likewise, nurses have led a large part of these programmes and assumed a relevant role in the patient safety plan. Based on this model of continuous quality and patient safety improvement, we periodically evaluate and monitor patient safety indicators.

We monitor the results in patient safety related to 26 different areas including the prevention of nosocomial infections, falls, pressure ulcers, errors related to the unequivocal identification of the patient, blood transfusions, safe surgery, medication management, among more than 70 indicators (Table 1).

Table 1. Patient safety results for a high-relevant selection of indicators in Mollet-Barcelona University Hospital (2020)

INDICATOR	RESULTS 2020
Hand hygiene adherence rate	63%
Adequacy of antibiotic prophylaxis in surgical interventions	70%
Methicillin-resistant Staphylococcus Aureus bacteraemia	0,16%
Fall risk assessment compliance	93%
Falls rate (per patient-days)	3,46%
Documented assessment of pressure ulcers risk	96%
Patients with nosocomial pressure ulcers	0%
Unequivocal patient identification compliance	97%
Blood transfusion errors due to inadequate patient identification	0%
Implementation of the surgical safety checklist	74%
Site surgical infection rate	2,5%
Medication errors with injury to the patient	4

However, one of the indicators that had not yet been evaluated in our centre is nurses’ perception of the PSC (Ministerio de Sanidad y Consumo, 2008), although a direct relationship is known between its deficiency and a high incidence of adverse events (Mardon et al., 2010).

What is the perception of PSC by our Hospital nursing staff? What factors influence the culture of safety of the hospital nursing staff? Our main objective was to determine the nursing staff perception of the institutional PSC. We specifically wanted to verify if it was the same in different healthcare units and departments and if there was a correlation between the dimensions of the PSC questionnaire and personal or professional variables of the nursing staff.

2. Methods

The proposed design corresponds to a correlational descriptive study with a cross-sectional quantitative approach.

2.1. Participants

The sampling was for convenience and included all the nurses who were working at Mollet-Barcelona University Hospital (Spain) in the different healthcare areas at the time of data collection. The Hospital has 160 beds, distributed in four inpatient units. It has seven operating rooms, one of them for major outpatient surgery. The emergency department includes a semi-critical area and an observation area, and 21 examination rooms as well. Outpatient services have dedicated nurses in the areas of endocrinology, nephrology, cardiology, surgery, traumatology, pulmonology, examination cabinets, and ancillary services (laboratory and radiology). The hospital includes a mental health and substance abuse department with nurses in all its facilities. At the time of data collection, all nurses in all healthcare departments in the hospital were invited to participate in the study. Nursing population was 244 nurses (234 assistants and 10 nursing managers), and 100% accepted the invitation to participate. The only inclusion criterion was to have a current employment contract with the institution at the time of the study, excluding nurses not present at work at that time due to unpaid leave.

2.2. Data collection

The study used the HSOPSC questionnaire of the AHRQ. The Quality Management Research Group of the University of Murcia adapted and validated this tool to the Spanish context (Gascón Cánovas et al., 2005). The questionnaire includes 42 questions that are answered using a five-point Likert scale and are grouped into 12 dimensions, made up of three or four items per composite (Table 2). Two dimensions refer to the hospital, and the rest focus on the unit or work area in which the respondent works. The questionnaire also includes the safety climate rating, represented through a subjective global appreciation of patient safety (from 0 to 10) and incident reporting during the last year (yes or no). Nine items use a five-point Likert scale to indicate the level of agreement ("strongly disagree" to "strongly agree"), and the other items use a five-point Likert scale to indicate frequency ("never" to "always"). Finally, the questionnaire asked for personal/professional factors, including sex, work shift, workday, job position, seniority, and unit or work area. The internal consistency of each dimension in the Spanish version is acceptable to excellent, with Cronbach's α ranges from 0.64 to 0.88.

Table 2. Questions of the Hospital Survey on Patient Safety Culture grouped according the 12 dimensions measured

A. RESULTS OF THE SAFETY CULTURE	
1. Frequency of Events Reported	<ul style="list-style-type: none"> - When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported? (40) - When a mistake is made, but has no potential to harm the patient, how often is this reported? (41) - When a mistake is made that could harm the patient, but does not, how often is this reported? (42)
2. Overall Perceptions of Patient Safety	<ul style="list-style-type: none"> - Patient safety is never sacrificed to get more work done (15) - Our procedures and systems are good at preventing errors from happening (18). - It is just by chance that more serious mistakes don't happen around here. (negatively worded) (10) - We have patient safety problems in this unit. (negatively worded) (17)
B. COMPOSITES OF SECURITY CULTURE AT THE UNIT OR WORK AREA	
3. Supervisor/Manager Expectations & Actions Promoting Patient Safety	<ul style="list-style-type: none"> - My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures (19) - My supervisor/manager seriously considers staff suggestions for improving patient safety (20) - Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts (negatively worded) (21) - My supervisor/manager overlooks patient safety problems that happen over and over. (negatively worded) (22)
4. Organizational Learning-Continuous Improvement	<ul style="list-style-type: none"> - We are actively doing things to improve patient safety (6) - Mistakes have led to positive changes here (9) - After we make changes to improve patient safety, we evaluate their effectiveness (13)
5. Teamwork Within Units	<ul style="list-style-type: none"> - People support one another in this unit (1) - When a lot of work needs to be done quickly, we work together as a team to get the work done (3) - In this unit, people treat each other with respect (4) - When one area in this unit gets really busy, others help out (11)
6. Communication Openness	<ul style="list-style-type: none"> - Staff will freely speak up if they see something that may negatively affect patient care (35) - Staff feel free to question the decisions or actions of those with more authority (37) - Staff are afraid to ask questions when something does not seem right. (negatively worded) (39)
7. Feedback & Communication About Error	<ul style="list-style-type: none"> - We are given feedback about changes put into place based on event reports (34) - We are informed about errors that happen in this unit (36) - In this unit, we discuss ways to prevent errors from happening again (38)
8. Nonpunitive Response to Errors	<ul style="list-style-type: none"> - Staff feel like their mistakes are held against them. (negatively worded) (8) - When an event is reported, it feels like the person is being written up, not the problem. (negatively worded) (12) - Staff worry that mistakes they make are kept in their personnel file. (negatively worded) (16)
9. Staffing	<ul style="list-style-type: none"> - We have enough staff to handle the workload (2) - Staff in this unit work longer hours than is best for patient care. (negatively worded) (5) - We use more agency/temporary staff than is best for patient care. (negatively worded) (7) - We work in "crisis mode" trying to do too much, too quickly. (negatively worded) (14)

10. Management Support for Patient Safety	<ul style="list-style-type: none"> - Hospital management provides a work climate that promotes patient safety (23) - The actions of hospital management show that patient safety is a top priority (30) - Hospital management seems interested in patient safety only after an adverse event happens. (negatively worded) (31)
C. COMPOSITES OF SECURITY CULTURE AT THE WHOLE HOSPITAL	
11. Teamwork Across Units	<ul style="list-style-type: none"> - There is good cooperation among hospital units that need to work together (26) - Hospital units work well together to provide the best care for patients (32) - Hospital units do not coordinate well with each other. (negatively worded) (24) - It is often unpleasant to work with staff from other hospital units. (negatively worded) (28)
12. Handoffs & Transitions	<ul style="list-style-type: none"> - Things "fall between the cracks" when transferring patients from one unit to another. (negatively worded) (25) - Important patient care information is often lost during shift changes. (negatively worded) (27) - Problems often occur in the exchange of information across hospital units. (negatively worded) (29) - Shift changes are problematic for patients in this hospital. (negatively worded) (33)

Note: In parentheses the question number in the survey (Agency for Healthcare Research and Quality, 2018)

The hospital intranet was the vehicle for administering the questionnaire and was accessible to hospital staff from 1 December 2018 to 31 January 2019.

2.3. Ethical considerations

When a member of the nursing staff accessed the intranet with his/her personal password, a warning screen appeared to inform about the characteristics of the study **and its purpose**, providing the option of answering the questionnaire. On the same screen, the nurse could select the option "Accept" or "Reply later", thus obtaining tacit consent of participation by agreeing to respond. All phases of the process guarantee anonymity and confidentiality. The study was approved by the ethics review board in our hospital and received the approval of the nursing director.

2.4. Data analysis

Data analysis used Jamovi-1.0.8.0 for MacOS. First, a descriptive analysis was made of all the variables included in the study. Categorical variables were summarised with their absolute and relative frequencies, and the continuous variables with their means and standard deviations (SDs).

The main outcome variable was the positive response rate, calculated as follows: the number of positive responses (score of 4 or 5 on a five-point Likert scale) to each question in a dimension divided by the total number of responses to all questions in the dimension. Negatively worded items were reverse coded

before calculation. A good safety culture or an area of strength was considered when the percentage of positive responses for one dimension was $\geq 75\%$. We interpreted the result as an example of a good safety culture or an area of strength, whereas a poor safety culture requiring improvement was identified when the percentage of negative responses (score of 1 or 2 on a five-point Likert scale) was $\geq 50\%$.

For the analysis of the internal consistency of the instrument in this study, reliability was calculated using Cronbach's α coefficient for each of the 12 dimensions and compared with those of the Spanish version of the HSOPSC questionnaire validated by the Ministry of Health, Social Services and Equality (Saturno, 2009). To treat each dimension as a quantitative variable, we obtained the mean of the responses in each dimension item, after changing the format of the questions formulated in the negative. Thus, each dimension took the original value ranging from 1 to 5, and the higher the value was, the more positive the assessment of that dimension was considered in terms of safety culture.

We also conducted a bivariate analysis using contingency tables to study the relationship between different variables. Using the Kolmogorov–Smirnov test, we found that the main variables (each of the dimensions of the questionnaire) did not follow a normal distribution. We also studied the possible relationships between main variables and personal and professional variables using the Mann–Whitney U test (for dichotomous variables) and the Kruskal–Wallis test (for categorical ones). The level of significance used in bilateral contrasts was $p < 0.05$ (alpha significance level of 5%).

3. Results

Two hundred and forty-four nurses responded, which represented 100% of the study population: 214 (87.7%) participants were women; 152 (62.3%) worked full time, with 126 (51.6%) working during the morning shift; 187 (76.6%) had been in the hospital for more than 5 years; and 234 (95.9%) were assisting nurses. Work areas with over-representation were the emergency department (68, 27.9%), the hospitalisation area (67, 27.5%), and the surgical area (51, 20.9%). The mental health department was under-represented (11, 4.5%).

3.1. Strengths and opportunities for improvement

The dimension with the highest number of positive responses was “Teamwork in the Unit/Work Area” (69.16%). Globally, no dimension had a frequency of positive responses of 75% or higher, so we cannot classify them as strengths (Table 3). On the other hand, the “Staffing” dimension received more than 50% negative responses (62.4%), thus becoming an opportunity for improvement (Table 3). The internal consistency of eight dimensions ranged from acceptable to excellent, given that Cronbach's α ranged from 0.62 to 0.90 and the global reliability of the instrument was 0.91.

Table 3. Relative frequencies by category for each dimension

DIMENSION	NEGATIVE (1-2) %	NEUTRAL (3) %	POSITIVE (4-5) %
1. Frequency of Events Reported	19,53	32,20	48,23
2. Overall Perceptions of Patient Safety	40,55	22,45	37,00
3. Supervisor/Manager Expectations & Actions Promoting Patient Safety	14,05	23,78	62,20
4. Organizational Learning-Continuous Improvement	18,70	24,03	57,23
5. Teamwork Within Units	13,95	16,88	69,15
6. Communication Openness	15,30	32,63	52,07
7. Feedback & Communication About Error	16,40	32,50	48,07
8. Nonpunitive Response to Errors	26,60	23,10	50,27
9. Staffing	62,40	14,35	23,28
10. Management Support for Patient Safety	36,20	28,43	35,37
11. Teamwork Across Units	25,10	25,10	49,78
12. Handoffs & Transitions	28,80	24,50	46,73

Note: Figures are percentage (%) of nurses assessing each dimension as negative (scores 1-2), neutral (score 3), or positive (scores 4-5) on a five-point Likert scale.

3.2. Safety climate rating

Regarding the two additional questions that assessed safety climate, "Rate from 0 to 10 the degree of patient safety in your unit/work area" obtained a mean value of 6.6 (SD 1.71), the minimum value being 2 and the maximum 10. Secondly, for the question "During the last year, have you reported in writing an incident related to patient safety?", 200 (82.0%) answered "no".

3.3. Work area/unit

Concerning the unit or work area, we found significant statistical differences in the mean punctuation out of five in some dimensions (Table 4). The emergency department nurses scored significantly below the rest of the staff in dimension 2, "Overall Perceptions of Patient Safety" (2.5, SD 0.7). However, mental health nurses scored above the rest of the staff in dimension 3, "Supervisor/Manager Expectations & Actions Promoting Patient Safety" (4.1, SD 0.8); dimension 6, "Communication Openness" (3.8, SD 0.5); and dimension 9, "Staffing" (3.7, SD 0.8). In the hospitalisation area, nurses valued "Teamwork Within Units" (dimension 5) with 3.9 (SD 0.7), above the nursing perception of PSC in the surgical area (3.4, SD 0.8).

Differences between units/work areas were statistically significant in dimension 11, "Teamwork Across Units" too, with the Mother & Child Area scoring the

highest (3.6, SD 0.8) and the Surgical Area the lowest (3, SD 0.6). “Management Support for Patient Safety” (dimension 10) was better perceived in the Mother & Child Area (3.3, SD 0.9), significantly higher with respect to the Emergency Service (2.7, SD 0.8). With respect to safety climate perception, the emergency department nurses rated the degree of patient safety significantly below the rest of the services (5.6 out of 10, SD 1.7), and the nurses from the inpatient area reported an incident within the last year to a greater extent (31.3%, 21/67).

Table 4. Results by unit/work area.

Comparison of 12-dimensions mean scores, rating of safety climate, and percentage of nurses reporting an incident within the last year in each unit or work area

	Emergency Department	Inpatient units	Mental Health & Substance Abuse Department	Mother & Child Area	Surgical Area	Examination cabinets & support services	Outpatient services
Dimension 1	3,2 (0,9)	3,4 (0,8)	3,4 (1)	3,5 (1,1)	3,5 (1)	3,5 (0,7)	3,4 (1,1)
Dimension 2	2,5 (0,7)**	3,1 (0,6)	3,4 (0,6)	2,9 (0,9)	2,9 (0,8)	3,1 (0,9)	3,4 (0,8)
Dimension 3	3,5 (0,7)	3,8 (0,7)	4,1 (0,8)*	3,5 (0,6)	3,5 (0,8)	3,5 (0,8)	3,2 (0,8)
Dimension 4	3,4 (0,6)	3,5 (0,6)	3,7 (0,5)	3,7 (0,6)	3,2 (0,9)	3,4 (0,7)	3,1 (1)
Dimension 5	3,7 (0,7)	3,9 (0,7)**	3,6 (0,7)	3,9 (0,7)	3,4 (0,8)**	3,9 (0,5)	3,6 (1)
Dimension 6	3,2 (0,7)	3,5 (0,6)	3,8 (0,5)*	3,4 (0,8)	3,6 (0,6)	3,5 (0,9)	3,5 (0,8)
Dimension 7	5,6 (0,6)	3,5 (0,6)	3,5 (0,8)	3,5 (1)	3,3 (0,9)	3,3 (0,6)	3,3 (0,7)
Dimension 8	3,3 (0,7)	3,2 (0,8)	3,8 (0,9)	3,3 (0,8)	3,3 (0,7)	3,5 (0,9)	3,4 (0,8)
Dimension 9	2,2 (0,6)	2,2 (0,6)	3,7 (0,8)**	2,6 (0,8)	2,5 (0,8)	2,6 (0,8)	2,9 (0,7)
Dimension 10	2,7 (0,8)*	3,0 (0,8)	3,2 (0,7)	3,3 (0,9)*	2,9 (0,9)	3,0 (0,9)	3,1 (1)
Dimension 11	3,1 (0,6)	3,4 (0,5)	3,5 (0,4)	3,6 (0,8)**	3,0 (0,8)**	3,3 (0,5)	3,4 (0,6)
Dimension 12	3,1 (0,7)	3,4 (0,7)	3,4 (0,6)	3,5 (0,8)	3,0 (0,7)	3,0 (0,6)	3,6 (0,4)**
Safety climate rating	5,6 (1,7)**	7,0 (1,5)	7,4 (1,6)	7,7 (1,4)	6,9 (1,3)	7,5 (1,7)	6,8 (2)
Incident Reported	16,2 % (11/68)	31,3 % (21/67)*	9,1% (1/11)	10% (2/20)	5,9 % (3/51)	21,4 % (3/14)	23,1% (3/13)

Note: In parenthesis, standard deviation (SD) in dimensions and in safety climate rating. In “Incident Reported”, parentheses show the number of nurses who replied “yes”/number of all nurses responding in this work area.

* p <0.05 ** p <0.001

3.4. Professional and personal variables

Referring to the personal and work variables of the nurses (Table 5), it is worth highlighting the following:

3.4.1. Seniority

Seniority was statistically significant in four dimensions. Nurses with less than 2 years in the organisation rated better than the rest, with significant dimensions being 2, "Overall Perceptions of Safety" (3.3, SD 0.6); 5, "Teamwork Within Units" (4.1, SD 0.5); 7, "Feedback & Communication About Error" (3.9, SD 0.7); and 10, "Management Support for Patient Safety" (3.4, SD 0.8). On the other hand, in dimension 6, "Communication Openness", nurses with more than 5 years of seniority scored better compared to those of the group with less seniority (3.5, SD 0.7). Regarding the safety climate, newer nurses scored better in the task "Rate from 0 to 10 the degree of patient safety in your unit/work area" (7.6 out of 10, SD 1.5). In contrast, 21.9% (41/187) of the nurses with more than 5 years of service reported an incident within the last year, which is significantly higher than in the newest group.

3.4.2. Workday

No statistically significant differences were found in relation to the duration of the working day in any of the 12 dimensions ($p > 0.05$). Regarding the safety climate, we found significant statistical differences in the question "During the last year, have you have reported an incident related to patient safety in writing?", since full-time nurses reported a higher percentage (24.3%, 37/152) than part-time workers (7.6%, 7/92).

3.4.3. Work position

Nurse managers scored above the care nurses in dimension 2, "Overall Perceptions of Safety" (3.3, SD 0.5); dimension 3, "Supervisor/Manager Expectations & Actions Promoting Patient Safety" (4.1, SD 0.5); dimension 8, "Nonpunitive Response to Errors" (3.9, SD 0.5); dimension 9, "Staffing" (3, SD 0.7); and dimension 10, "Management Support for Patient Safety" (3.6, SD 0.7). The work position was also significant in incident reporting during the last year. Eighty percent (8/10) of nursing managers reported incidents in the system, whereas 15.4% (36/234) of care nurses notified of incidents related with patient safety.

3.4.4. Work shift

Night-shift nurses valued significantly better dimension 4, "Organisational Learning–Continuous Improvement", and dimension 5, "Teamwork Within Units" (3.7 [SD 0.6] and 4 [SD 0.7], respectively). The morning-shift nursing staff scored dimension 6, "Openness in Communication", better than the afternoon and evening shifts (3.6, SD 0.7).

Table 5. Results by staff demographics.

Comparison of dimensions mean scores, rating of safety climate, and percentage of nurses reporting an incident within the last year by professional/personal variables

	SENIORITY		WORKDAY		WORK POSITION		WORK SHIFT		SEX	
Dimension 1	<2 years	3,5 (0,9)	Full time	3,3 (0,9)	Nursing manager	3,7 (0,7)	Morning	3,3 (0,9)	Man	3,6 (0,7)
	2-5 years	3,5 (0,9)	Part time	3,5 (0,9)	Care nurse	3,4 (0,9)	Afternoon	3,3 (0,9)	Woman	3,3 (1)
	>5 years	3,3 (0,9)					Night	3,3 (0,9)		
Dimension 2	<2 years	3,3 (0,6)*	Full time	2,9 (0,8)	Nursing manager	3,3 (0,5)*	Morning	2,9 (0,8)	Man	3,1 (0,7)
	2-5 years	2,8 (0,8)	Part time	3,0 (0,8)	Care nurse	2,9 (0,8)	Afternoon	2,8 (0,7)	Woman	2,9 (0,8)
	>5 years	2,9 (0,8)					Night	2,9 (0,7)		
Dimension 3	<2 years	3,9 (0,6)	Full time	3,6 (0,7)	Nursing manager	4,1 (0,5)*	Morning	3,7 (0,7)	Man	3,6 (0,9)
	2-5 years	3,6 (0,7)	Part time	3,6 (0,8)	Care nurse	3,6 (0,7)	Afternoon	3,6 (0,8)	Woman	3,6 (0,7)
	>5 years	3,6 (0,8)					Night	3,4 (0,7)		
Dimension 4	<2 years	3,7 (0,6)	Full time	3,4 (0,7)	Nursing manager	3,7 (0,4)	Morning	3,3 (0,8)	Man	3,6 (0,7)
	2-5 years	3,5 (0,8)	Part time	3,4 (0,8)	Care nurse	3,4 (0,7)	Afternoon	3,4 (0,7)	Woman	3,4 (0,7)
	>5 years	3,4 (0,7)					Night	3,7 (0,6)**		
Dimension 5	<2 years	4,1 (0,5)*	Full time	3,7 (0,7)	Nursing manager	3,8 (0,5)	Morning	3,7 (0,7)	Man	3,9 (0,6)
	2-5 years	3,6 (0,7)	Part time	3,7 (0,8)	Care nurse	3,7 (0,8)	Afternoon	3,6 (0,8)	Woman	3,7 (0,8)
	>5 years	3,7 (0,8)					Night	4,0 (0,7)*		
Dimension 6	<2 years	3,4 (0,6)	Full time	3,5 (0,7)	Nursing manager	3,8 (0,7)	Morning	3,6 (0,7)	Man	3,4 (0,8)
	2-5 years	3,2 (0,7)	Part time	3,4 (0,6)	Care nurse	3,4 (0,7)	Afternoon	3,4 (0,6)	Woman	3,5 (0,7)
	>5 years	3,5 (0,7)**					Night	3,3 (0,7)		
Dimension 7	<2 years	3,9 (0,7)**	Full time	3,3 (0,7)	Nursing manager	3,7 (0,6)	Morning	3,4 (0,8)	Man	3,6 (0,7)
	2-5 years	3,4 (0,7)	Part time	3,5 (0,8)	Care nurse	3,4 (0,7)	Afternoon	3,4 (0,7)	Woman	3,4 (0,7)
	>5 years	3,3 (0,7)					Night	3,4 (0,6)		
Dimension 8	<2 years	3,3 (0,7)	Full time	3,3 (0,8)	Nursing manager	3,9 (0,5)**	Morning	3,3 (0,8)	Man	3,3 (0,9)
	2-5 years	3,3 (0,7)	Part time	3,3 (0,8)	Care nurse	3,3 (0,8)	Afternoon	3,4 (0,7)	Woman	3,3 (0,7)

	>5 years	3,3 (0,8)					Night	3,2 (0,8)		
Dimension 9	<2 years	2,7 (0,7)	Full time	2,4 (0,7)	Nursing manager	3,0 (0,7)*	Morning	2,5 (0,8)	Man	2,5 (0,8)
	2-5 years	2,4 (0,8)	Part time	2,4 (0,8)	Care nurse	2,4 (0,7)	Afternoon	2,3 (0,8)	Woman	2,4 (0,7)
	>5 years	2,4 (0,7)					Night	2,3 (0,6)		
Dimension 10	<2 years	3,4 (0,8)	Full time	2,9 (0,9)	Nursing manager	3,6 (0,7)*	Morning	3,0 (0,9)	Man	3,0 (0,8)
	2-5 years	2,9 (0,9)	Part time	3,0 (0,9)	Care nurse	2,9 (0,9)	Afternoon	2,8 (0,8)	Woman	2,9 (0,9)
	>5 years	2,9 (0,8)					Night	3,0 (0,8)		
Dimension 11	<2 years	3,5 (0,6)	Full time	3,2 (0,7)	Nursing manager	3,4 (0,6)	Morning	3,3 (0,7)	Man	3,2 (0,6)
	2-5 years	3,2 (0,7)	Part time	3,4 (0,6)	Care nurse	3,3 (0,7)	Afternoon	3,1 (0,7)	Woman	3,3 (0,7)
	>5 years	3,2 (0,7)					Night	3,4 (0,6)		
Dimension 12	<2 years	3,4 (0,7)	Full time	3,2 (0,7)	Nursing manager	3,5 (0,5)	Morning	3,3 (0,7)	Man	3,2 (0,6)
	2-5 years	3,1 (0,9)	Part time	3,2 (0,8)	Care nurse	3,2 (0,7)	Afternoon	3,1 (0,7)	Woman	3,2 (0,7)
	>5 years	3,2 (0,7)					Night	3,1 (0,7)		
Safety climate rating	<2 years	7,6 (1,5)*	Full time	6,5 (1,7)	Nursing manager	7,4 (1,2)	Morning	6,9 (1,8)	Man	7 (1,5)
	2-5 years	6,5 (2)	Part time	6,9 (1,7)	Care nurse	6,7 (1,7)	Afternoon	6,4 (1,7)	Woman	6,6 (1,7)
	>5 years	6,6 (1,7)					Night	6,7 (1,6)		
Incident Reported	<2 years	4,3% (1/23)	Full time	24,3% (37/152) **	Nursing manager	80% (8/10)**	Morning	19,8% (25/126)	Man	20% (6/30)
	2-5 years	5,9% (2/34)	Part time	7,6% (7/92)	Care nurse	15,4% (36/234)	Afternoon	14,5% (10/69)	Woman	17,8% (38/214)
	>5 years	21,9% (41/187)*					Night	18,4% (9/49)		

Note: In parenthesis, standard deviation (SD) in dimensions and in safety climate rating. In "Incident Reported", parentheses show the number of nurses who replied "yes"/number of all nurses responding in this work area.

* p <0.05 ** p <0.001

4. Discussion

The results revealed that the nursing staff at our hospital perceived the culture of safety similar to other Spanish hospitals' nursing staff (Rivera-Romero et al., 2012; Bernalte-Martí et al., 2015; Mella Laborde et al., 2020) and in other countries around the world such as Lebanon (El-Jardali et al., 2010), Colombia (Gómez Ramírez et al., 2011), Belgium (Vlayen et al., 2012), Turkey (Günes et al., 2016), Arab countries (Elmontsri et al., 2017), United States (Famolaro et al., 2018) and Arabia Saudi (Hazazi & Noor Qattan, 2020). Although any dimension was considered a strength, "Teamwork in the Unit / Work Area" is the dimension with the highest number of positive responses and "Staffing" was identified as a weakness.

Safety culture in our hospital was perceived as weak by nursing staff because none of the 12 dimensions was rated above 75% so we cannot classify them as strengths according to the interpretation of the results provided by the HSOPSC tool. This poor qualification could be derived from the perception of a low staffing ratio. In units where staffing ratio was clearly perceived as low, patient safety was rated worse. This is in accordance with the results of studies that found a correlation between the level of nursing staffing and in-hospital mortality (Diya et al., 2012; Aiken et al., 2017).

Considering the relevance of the notification of incidents in the improvement of patient safety, we found that more than 80% of the respondents declared to have not reported any patient safety event during the last 12 months. This result could show that patient safety problems are unnoticed or not conveniently addressed in this moment and could explain the general low perception of a safety culture. It also is a demonstration that implementation of notification systems, being a relevant stage in creating a safety culture, is not enough to promote this culture if not accompanied by a clear exemplification of a non-punitive response to errors, transparency, and feedback in the communication (Howell et al., 2015; Rea & Griffiths, 2016).

Unlike other studies, it should be noted that frankness in communication was perceived better by nurses with more experience in the organization (Toren et al., 2021), who also reported safety incidents to a greater extent. More experienced personnel are likely to be more familiar with the error reporting system and probably have high awareness of errors that occur within the unit (Famolaro et al., 2018; Hazazi & Noor Qattan, 2020).

Nurses generally become nurses out of a desire to support people regain and maintain optimal health. The expectation of nurses is to facilitate a culture of safety in healthcare settings, recognizing and addressing threats to people and safe care in healthcare practices, services and settings (International Council of Nurses, 2021). This professional expectation conflicts with the lack of confidence, the fear of punitive actions and the need to cover the learning curve by novice nurses, could explain why new nurses, having a better perception of patient safety and experiencing better feedback on errors, they report less incidents than more experienced nurses (Fernandes de Freitas et al., 2011).

Nurses' lack of commitment to patient safety might also be related with fear of a punitive response to declared errors, perception of a lack of support from management, uncertainty associated with the possibility of a lawsuit, or the simple fact that they do not know how to access the reporting system in the hospital (Mella Laborde et al., 2018). In fact, it was precisely in the nursing managers group where the dimensions "Overall Perceptions of Patient Safety", "Nonpunitive Response to Errors", and "Supervisor/Manager Expectations & Actions Promoting Patient Safety" were better scored. This group had a higher percentage of nurses who had reported patient safety incidents during the last year. "Teamwork Within Units" was the best-valued dimension, as in other national and international studies that consider teamwork and relationships with colleagues as a protective factor (Gómez Ramírez et al., 2011; Rivera-Romero et al., 2012; Mella Laborde et al., 2018).

On the other hand, the higher scores obtained in the mental health department are also consistent with multicentre studies, where psychiatric centres obtain positive scores in a higher proportion (Vlayen et al., 2012). This suggests that those departments promote better PSC or staff are perceived more at risk in acute care units. The latter is probably due to the more complex activities performed in these areas that result in a higher volume of unsafe practices and a worse perception of safety from acute care unit (inpatient units, emergency room, or surgical areas) staff.

4.1. Limitations of the study

A limitation of this study is that it mainly focuses on nursing, which might not adequately capture the complex multidisciplinary nature of the PSC in healthcare settings. Another limitation to consider is the instrument used, as there are other instruments, although the HSOPSC is the most widely used in the European Union and is specific for hospitals (Waterson, 2019).

Furthermore, although the nature of the survey-based study provided the nurses' perception of patient safety culture, it did not provide an in-depth information on aspects related to fear of a punitive response to declared errors, or the perception of lack management support, neither the factors influencing the reporting of incidents. Qualitative exploration of nurses' experiences in patient safety incidents is required to explore this further.

5. Conclusions

PSC is not sufficiently perceived by nursing staff in our institution, although some strengths were identified. Mutual support, respect, and collaboration among colleagues could be root points to support future interventions to achieve a culture that promotes a high-reliability organisation, based on trusting, informing, and improving (Chassin & Loeb, 2013).

The results obtained in this study do not differ from data obtained in studies carried out in other facilities. However, they evidence the need to carry out an

in-depth study of the meanings that nurses give to their experiences in relation to PSC in revising their perception. The crucial impact of organizational culture on patient safety and the importance of implementing change interventions and patient safety approaches at the systemic and organizational level to promote the development of an organization's safety culture is recognized (Arora, 2021). However, variation between different healthcare units confirm that PSC is a specific local phenomenon and that it may be better to focus on improving the local culture in each unit.

Change is not an easy task for institutions but conducting studies that demonstrate the state of organizations' safety culture is a first step toward change and establishing improvements. The culture of safety is little studied in relation to subcultures that are created in the same organization (Granel, 2018). This work shows that safety plans must be specific for each unit, considering its specific strengths and weaknesses. In future management practice, planning for the development of patient safety programs will no longer be the same throughout the hospital, it should be focused on each unit in a specific way, identifying areas for improvement and concrete initiatives in patient safety, also oriented to nursing populations, considering adaptations to nursing seniority, shifts and working positions. This will contribute as a fractal approach to the entire organisation's PSC (Halligan & Zecevic, 2011).

Key points

1. This study demonstrated that safety culture in our hospital was perceived as weak by nursing staff, emphasizing that in units where a low staffing ratio was clearly perceived, patient safety was rated worse.
2. Implementation of notification systems, being a relevant stage in creating a safety culture, is not enough to promote patient safety culture.
3. The variation of perception of safety culture between different healthcare units confirm that PSC is a specific local phenomenon and that it may be better to focus on improving the local culture in each unit.
4. Our findings suggest the need to develop different strategies to improve the patient safety culture in each specific work area, rather than using the same strategy throughout the hospital.

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