

# PATIENT SAFETY CULTURE IN INTENSIVE CARE: INTEGRATIVE REVIEW

## CULTURA DE SEGURANÇA DO PACIENTE EM TERAPIA INTENSIVA: REVISÃO INTEGRATIVA

## CULTURA DE LA SEGURIDAD DEL PACIENTE EN CUIDADOS INTENSIVOS: REVISIÓN INTEGRATIVA

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**Objective:** to identify the knowledge produced in the literature on patient safety culture in intensive care. **Method:** this is an integrative review based on the theoretical framework of Whittemore and Knaf, carried out at the portals PubMed, Virtual Health Library (VHL) and Scientific Electronic Library Online (SciELO), through the crossing of the descriptors “organizational culture”, “patient safety”, and “intensive care units”, through the Boolean operator “AND”, totaling 22 publications. **Results:** three categories of evidence were identified: instruments for assessing the patient safety culture, strengths and weaknesses of the patient safety culture in intensive care, patient safety culture in intensive care and associated factors. **Conclusion:** the publications demonstrated the difficulty to build a local safety culture, since none presented a positive patient safety culture. However, factors associated with the safety culture were demonstrated, in which it is possible to intervene for its better implementation.

**Descriptors:** Intensive Care Units. Patient Safety. Organizational Culture.

*Objetivo: identificar o conhecimento produzido na literatura sobre a cultura de segurança do paciente em cuidados intensivos. Método: trata-se de uma revisão integrativa fundamentada no referencial teórico de Whittemore e Knaf, realizada nos portais PubMed, Biblioteca Virtual da Saúde (BVS) e Scientific Electronic Library Online (SciELO), mediante cruzamento dos descritores “organizational culture”, “patient safety”, e “intensive care units”, por meio do operador booleano “AND”, totalizando 22 publicações. Resultados: foram identificadas três categorias de evidências: instrumentos para avaliação da cultura de segurança do paciente, fortalezas e fragilidades da cultura de segurança do paciente em terapia intensiva, cultura de segurança do paciente em terapia intensiva e fatores associados. Conclusão: as publicações demonstraram o quanto é difícil construir uma cultura de segurança local, já que nenhuma apresentou uma cultura de segurança do paciente positiva. Entretanto, foram demonstrados fatores associados à cultura de segurança, nos quais é possível intervir para melhor efetivá-la.*

*Descritores: Unidades de Terapia Intensiva. Segurança do Paciente. Cultura Organizacional.*

*Objetivo: identificar los conocimientos producidos en la literatura sobre la cultura de la seguridad del paciente en cuidados intensivos. Método: se trata de una revisión integrativa basada en el marco teórico de Whittemore y Knaf,*

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*llevada a cabo en los portales PubMed, Biblioteca Virtual en Salud (BVS) y Scientific Electronic Library Online (SciELO), a través del cruce de los descriptores “organizational culture”, “patient safety”, y “intensive care units”, a través del operador booleano “AND”, totalizando 22 publicaciones. Resultados: se identificaron tres categorías de evidencia: instrumentos para evaluar la cultura de la seguridad del paciente, fortalezas y debilidades de la cultura de la seguridad de los pacientes en cuidados intensivos, cultura de la seguridad del paciente en cuidados intensivos y factores asociados. Conclusión: las publicaciones demostraron lo difícil que es construir una cultura de seguridad local, ya que ninguna presentaba una cultura positiva de seguridad del paciente. Sin embargo, se demostraron factores asociados con la cultura de la seguridad, en los que es posible intervenir para mejorar la efectuar.*

*Descriptores: Unidades de Cuidados Intensivos. Seguridad del Paciente. Cultura Organizacional.*

## Introduction

The provision of health care brings significant improvements to its users, but the risk of damage in its execution is recognized, which can expose patients to serious and often irreversible consequences, besides generating significant physical, social and economic costs<sup>(1)</sup>. For this reason, the approach of patient safety in the hospital environment, admitted as a dimension of health quality, has been gaining strength in recent years<sup>(2)</sup>.

Patient safety is conceptualized by the World Health Organization (WHO) as reducing, to an acceptable minimum, the risk of unnecessary harm associated with health care<sup>(3)</sup>. Thus, even if risks exist and are inherent to care practice, improvement actions must be implemented constantly in order to reduce the likelihood that patients will be victims of harm associated with the provision of health care.

Ten thematic areas that affect patient safety were presented by the WHO. The patient safety culture is described in this composition, being pointed out as one of the organizational and management factors that influence health care<sup>(4)</sup>.

In Brazil, in 2013, the National Patient Safety Program (PNSP) was created. Among the various strategies for implementing the PNSP, art. 5 stresses the promotion of the safety culture<sup>(5)</sup>. Defined as the product of individual and collective values, attitudes, perceptions, competencies and behavior patterns that determine the commitment, style and proficiency of a health organization in the management of patient safety, its development is essential for the provision of safe and quality health care<sup>(6)</sup>.

To transform and consolidate a service's safety culture, the first step is to get to know it. Once this evaluation is concluded, it is possible to identify the areas that need improvement, enabling more effective interventions, as well as the positive aspects, in order to strengthen them<sup>(7)</sup>.

Therefore, several research instruments were developed to measure safety culture in the hospital context. The Safety Attitudes Questionnaire (SAQ) and the Hospital Survey on Patient Safety Culture (HSOPSC) stand out. Both are widely used worldwide and have been translated and validated for the Brazilian reality<sup>(8)</sup>.

The implementation and evaluation of the safety culture becomes necessary in the most diverse health care delivery environments, especially in intensive care units (ICU). This is a critical area, destined to the hospitalization of severe patients, exposed to important risk factors associated with the occurrence of adverse events<sup>(9)</sup>. Data from the National Health Surveillance Agency (Anvisa) show that ICUs are the second hospital unit with more reports of healthcare-related incidents<sup>(10)</sup>.

In this scenario, hospital and ICU managers should ensure the safety and protection of patients, as well as records of evaluations of the overall functioning pattern of the ICU should be monitored and kept, in addition to events that may indicate the need to improve care quality<sup>(9)</sup>.

The magnitude of adverse events in ICUs and the indispensability of conducting safety culture assessments, with their consequent establishment, within the scope of critical care,

since health damage is avoidable, consolidate the understanding that the safety culture among employees should be sought.

It is believed that the searches of this research will allow exploring the global panorama related to the theme, stimulating several health institutions to know their realities, with a view to implementing necessary improvements, strengthening the provision of safe and quality care.

The aim of this study is to identify the knowledge produced in the national and international literature on patient safety culture in intensive care.

## Method

This is an integrative review carried out in July 2019, based on the theoretical framework of Whittemore and Knaf<sup>(11)</sup>. It was developed in the following stages: identification of the theme and selection of the research question, establishment of inclusion and exclusion criteria, identification of selected studies, categorization of studies, analysis and interpretation of results, synthesis of knowledge.

To select the publications, the Health Sciences Descriptors (DeCS) and the Medical Subject

Headings (MeSH), “organizational culture”, “patient safety”, and “intensive care units” were crossed, using the Boolean operator “AND” at the PubMed portals, Virtual Health Library (VHL) and Scientific Electronic Library Online (SciELO).

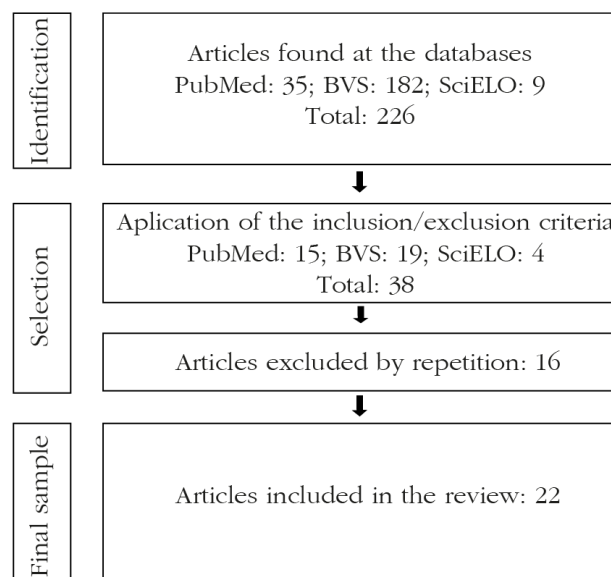
The investigation was conducted by the following question: What is the knowledge produced in the national and international literature on patient safety culture in intensive care units?

The review included original articles that addressed the patient safety culture as a central theme, developed in ICUs, published in the past ten years (2009 to 2019), in the Portuguese, English and Spanish languages. Review articles, editorials, theses, dissertations, texts that were not fully available full and outside the established timeframe were excluded. Articles repeated in more than one database were included only once.

The publications were initially selected based on the reading of the title and abstract, to identify if they were part of the research theme and establish which texts would be fully read.

After reading the selected studies, those that met the inclusion criteria became part of the review, totaling 22 studies, according to Flowchart 1.

**Flowchart 1** – Selection of the publications



Source: Created by the authors.

After exploratory reading of the publications found, a synoptic chart was created in order to synthesize the main information. Thus, it became possible to identify title, objective, instrument used to evaluate the safety culture and main results.

For analysis, interpretation of the data and synthesis of knowledge, the main similarities found in the studies were evidenced, which were synthesized and grouped, emerging three categories of evidence for analysis.

## Results

The analysis of the 22 publications found revealed that 8 (36.3%) were performed in the United States (USA), 7 (31.8%) in Brazil, 2 (9.1%) Norway and Iran, and 1 (4.5%) in Australia, Sweden and China. Brazilian productions were developed only in the South and Southeast regions of the country. English was the publishing language of 15 (68.2%) studies and 7 (31.8%) were published in Portuguese.

Regarding the distribution by temporality, there was a higher number of studies in the years 2014, 2016 and 2017, accounting 4 (18.2%)

in each of these years, followed by 2013, with 3 (13.6%) publications, 2012 and 2015, with 2 (9.1%), and 2010, 2018 and 2019, each with 1 (4.5%) publication. There were no studies published in 2009 and 2011. Regarding the research developed in Brazil, it was verified its presence from the year 2013, when the PNSP was created.

A significant number of productions in nursing journals were revealed, totaling 10 (45.5%), which demonstrates the awareness and interest of this category in relation to the theme under analysis.

The instruments used to collect data regarding the patient safety culture were the HSOPSC, in 10 (45.5%) and the SAQ, in 7 (31.8%) investigations. Four evaluations (18.1%) used these 2 questionnaires. Only 1 (4.5%) research applied semi-structured interviews. For data analysis, 21 (95.5%) articles employed quantitative approach methodology and only 1 (4.5%) addressed the data qualitatively.

To facilitate the understanding of the information, a synoptic chart (Chart 1) was created with the summary of the data from this review, as presented below.

**Chart 1** – Distribution of the publications selected according to the title, objective(s), instrument used for evaluation and main results

(continued)

N.	Title	Objective(s)	Instrument for evaluation	Main results
1	Burnout in the NICU setting and its relation to safety culture <sup>(12)</sup> .	To examine the relationship between caregiver burnout and patient safety culture.	Safety Attitudes Questionnaire	Significant association between high burnout scores and low safety culture scores.
2	Changes in patient safety culture after restructuring of intensive care units: Two cross-sectional studies <sup>(13)</sup> .	To compare changes in nurses' perception of patient safety culture in restructured and unstructured intensive care units.	Hospital Survey on Patient Safety Culture	The restructuring of the units was negatively associated with the change in the safety culture.
3	CNE article: safety culture in Australian intensive care units: establishing a baseline for quality improvement <sup>(14)</sup> .	To establish a basic understanding of the safety culture in Australian intensive care units.	Safety Attitudes Questionnaire	Low proportion of positive responses ranging from 18.8% to 48.1%. The professional category was associated with some dimensions.

**Chart 1** – Distribution of the publications selected according to the title, objective(s), instrument used for evaluation and main results (continued)

N.	Title	Objective(s)	Instrument for evaluation	Main results
4	Comparing NICU teamwork and safety climate across two commonly used survey instruments <sup>(15)</sup> .	To assess the variation in the safety and teamwork climate in the neonatal ICU environment and compare the measurement of safety culture scales using two different instruments.	Safety Attitudes Questionnaire e Hospital Survey on Patient Safety Culture	Gender, professional category, length of professional experience, and size of the ICU were associated with the safety culture.
5	Culture and organizational climate for patient safety in Intensive Care Units <sup>(8)</sup> .	To evaluate health professionals' perception of the climate and the culture of patient safety in Intensive Care Units and the relationship between the instruments Hospital Survey on Patient Safety Culture and the Safety Attitudes Questionnaire.	Safety Attitudes Questionnaire e Hospital Survey on Patient Safety Culture	The scales showed good reliability. The correlation between the scales was of moderate strength ( $r = 0.66$ ).
6	Evaluation of the association between Hospital Survey on Patient Safety Culture (HSOPS) measures and catheter-associated infections: results of two national collaboratives <sup>(16)</sup> .	To examine the association between hospital unit results for the Hospital Survey on Patient Safety Culture and the catheter-related infection rates.	Hospital Survey on Patient Safety Culture	No associations were found between the results of the Hospital Survey on Patient Safety Culture and catheter-related infection rates.
7	Assessment of patient safety culture in neonatal intensive care <sup>(17)</sup> .	To analyze the culture of patient safety from the perspective of nursing and medical teams.	Hospital Survey on Patient Safety Culture	43% of positive responses in the entire questionnaire and no dimension scored above 75%.
8	Exposure to Leadership WalkRounds in neonatal intensive care units is associated with a better patient safety culture and less caregiver burnout <sup>(18)</sup> .	To evaluate the association between feedback from safety rounds, patient safety culture and caregiver burnout.	Safety Attitudes Questionnaire e Hospital Survey on Patient Safety Culture	Greater achievement of feedback was associated with better safety culture results.
9	Intensive care unit safety culture and outcomes: a US multicenter study <sup>(19)</sup> .	To determine whether the ICU safety culture is independently associated with the patient's hospital mortality and length of stay.	Safety Attitudes Questionnaire	Decreasing scores for management perceptions increased the chance of death. Reduction in the safety climate score increased the length of stay.

**Chart 1** – Distribution of the publications selected according to the title, objective(s), instrument used for evaluation and main results (continued)

N.	Title	Objective(s)	Instrument for evaluation	Main results
10	Neonatal intensive care unit safety culture varies widely <sup>(20)</sup> .	To describe safety culture assessments, explore variability within and between Neonatal Intensive Care Units in the fields of safety culture and test of association with the professionals' characteristics.	Safety Attitudes Questionnaire	The doctors' scores were higher than that of the nursing team.
11	On the CUSP: Stop BSI: evaluating the relationship between central line-associated bloodstream infection rate and patient safety climate profile <sup>(21)</sup> .	To measure the safety climate to investigate the relationship between patient safety climate profiles in the Intensive Care Units and rates of bloodstream infection associated with central access.	Hospital Survey on Patient Safety Culture	Intensive Care Units with conflicting climates had a significantly higher risk of bloodstream infection associated with central access compared to Intensive Care Units with a generative leadership climate.
12	Patient safety culture in neonatal intensive care units: perspectives of the nursing and medical team <sup>(22)</sup> .	To check the evaluation of the patient safety culture according to the function and time of experience of the nursing and medical teams.	Hospital Survey on Patient Safety Culture	The overall score for positive responses was 43%. The answers differed according to the professional category, time working in the hospital, time working in the unit, time working in the profession.
13	Patient safety culture in an intensive care unit: perspective of the nursing team <sup>(23)</sup> .	To identify and compare the dimensions of the patient safety culture from the perspective of nursing professionals from two Intensive Care Units.	Hospital Survey on Patient Safety Culture	The dimensions with the highest positive evaluation were teamwork in the units, expectations and actions to promote the safety of the supervisor and organizational learning.
14	Patient Safety Culture in Intensive Care Units from the Perspective of Nurses: A Cross-Sectional Study <sup>(24)</sup> .	To research the patient safety culture from the perspective of nurses in Intensive Care Units.	Hospital Survey on Patient Safety Culture	The overall score of positive answers was 57,7%, which indicated that the safety culture level was medium.
15	Patient safety culture in intensive care: nursing recommendations <sup>(25)</sup> .	To systematize the recommendations of nursing professionals about patient safety.	Hospital Survey on Patient Safety Culture	Greater number of recommendations for the dimensions of organizational and continuous learning, personal improvement, and general perception of patient safety.

**Chart 1** – Distribution of the publications selected according to the title, objective(s), instrument used for evaluation and main results (conclusion)

N.	Title	Objective(s)	Instrument for evaluation	Main results
16	Safety culture in intensive care units <sup>(26)</sup> .	To assess the patient safety culture from the perspective of health team professionals.	Safety Attitudes Questionnaire	The average score obtained by the Safety Attitudes Questionnaire was 62.38 points.
17	Systematic simulation-based team training in a Swedish intensive care unit: a diverse response among critical care professions <sup>(27)</sup> .	To examine the relationship between simulation-based team training and safety.	Safety Attitudes Questionnaire	The perception of the nursing team about the factors of the Safety Attitudes Questionnaire was more positive after the project.
18	The association between patient safety culture and burnout and sense of coherence: A cross-sectional study in restructured and not restructured intensive care units <sup>(28)</sup> .	To study the associations between nurses' perception of patient safety culture, burnout and sense of coherence.	Hospital Survey on Patient Safety Culture	A positive safety culture was statistically associated with a low burnout score and a strong sense of coherence.
19	The Effect of a Freely Available Flipped Classroom Course on Health Care Worker Patient Safety Culture: A Prospective Controlled Study <sup>(29)</sup> .	To assess the impact of a standardized patient safety course on the patient safety culture.	Hospital Survey on Patient Safety Culture	After the safety course, there was a significant improvement in responses to teamwork within hospital units and support from hospital management for patient safety.
20	The Safety Attitudes Questionnaire as a tool for benchmarking safety culture in the NICU <sup>(30)</sup> .	To determine whether the dimensions of the safety culture provide consistent results when used as a performance measure of the Intensive Care Unit.	Safety Attitudes Questionnaire	The Safety Attitudes Questionnaire can be a useful tool for comparative performance assessments between Neonatal Intensive Care Units.
21	The effect of nurse empowerment educational program on patient safety culture: a randomized controlled trial <sup>(31)</sup> .	To determine the effect of training nurses and supervisors through an educational program.	Hospital Survey on Patient Safety Culture	In the experimental group, the scores were significantly higher than those in the control group.
22	Safety culture in intensive care units: perspective of health professionals <sup>(2)</sup> .	To know the patient safety culture in intensive care units.	Semi-structured interviews	Two categories emerged: Perception of error and Error management.

Source: Created by the authors.

## Discussion

The information extracted from the productions was grouped according to the

similarities found in three categories: analysis of instruments for evaluation of the patient's safety culture, composed of articles 4, 5, and 20; strengths and weaknesses of the patient safety

culture in intensive care, composed of articles number 3, 5, 7, 10, 13, 14, 15, 16, 18, 19, and 22; patient safety culture in intensive care and associated factors, composed of articles number 1, 2, 4, 6, 8, 9, 11, 12, 17, 19, 20 and 21.

### *Analysis of the instruments for evaluation of the patient safety culture*

The analyzed publications used the HSOPSC, the SAQ and semi-structured interviews to perform their evaluations. The HSOPSC consists of 42 items, distributed in 12 dimensions. Areas of strength for patient safety are considered those dimensions in which more than 75% of the interviewees provided positive answers to patient safety. Likewise, a positive local patient safety culture is considered, when there is a general level of patient safety culture above 75%<sup>(23)</sup>.

The SAQ consists of 41 items, distributed in 6 domains. The score of the instrument ranges from 0 to 100 and the values are considered positive, when the total score is greater than or equal to 75<sup>(32)</sup>.

Both are widely used worldwide and have been validated for the Brazilian reality<sup>(8)</sup>.

Three studies were dedicated to the exploration and comparison of instruments for measuring the patient safety culture, which are composed of dimensions or domains that capture the behavior of professionals on fundamental aspects of patient safety.

The SAQ was presented as a useful tool for comparative performance evaluations among NICUs in North American research, providing a parameter to assess the need and opportunities for quality improvement initiatives<sup>(30)</sup>.

Likewise, in order to compare the performance of NICUs in a safety climate and teamwork climate between the SAQ and the HSOPSC, it was found that these aspects of the two instruments were strongly correlated. For each scale, the use of both questionnaires resulted in similar performance in the same ICU<sup>(15)</sup>.

However, when comparing the results of several ICUs, their performances differed

strongly. For example, an ICU ranked 23<sup>rd</sup> in the HSOPSC would have ranked 3<sup>rd</sup> in the SAQ. Therefore, although areas of agreement between the instruments have been found, due to such distinctions, one should be careful in the comparison and transition of use between instruments<sup>(15)</sup>.

A Brazilian study also analyzed the relationship between SAQ and HSOPSC. The overall HSOPSC score and “safety climate” domain of the SAQ, the overall HSOPSC score and the overall SAQ score, and the “feedback of information and communication about errors” of the HSOPSC and general SAQ scores, were the highest correlations found with statistical significance ( $p < 0.000$ ), but with moderate correlation values. Such moderate correlations were related to the fact that the items of most dimensions of the HSOPSC address the error directly, different from the SAQ scale<sup>(8)</sup>.

The results of the last two productions do not show that the instruments are equivalent and the reduced number of publications that provide information on the comparison of instruments indicate the need for further investigations.

### *Strengths and weaknesses of the patient safety culture in intensive care*

Patient safety culture assessment can be used, among other things, to assess the status of the patient safety culture and identify strengths and areas to improve the safety culture.

Of the 11 productions that reported the descriptive results of safety culture assessments, seven used the HSOPSC. None of these were considered a positive local patient safety culture<sup>(8,17,23-24,28-29)</sup>.

Regarding the dimensions, most studies did not present any dimension with a percentage of positive responses above 75%, except for three, which were developed in Brazil, Iran, and Norway. The first with only one dimension with this characteristic and the other with two dimensions considered strong for safety<sup>(8,17,23-24,28-29)</sup>.

Of the four publications that used the SAQ as an evaluation instrument, none obtained



an overall score higher than 75, and two demonstrated only one domain with more than 75 points<sup>(8,14,20,26)</sup>. These results were similar to those found with HSOPSC, which suggests the complexity of achieving the patient safety culture in critical care environments.

The evaluations from the HSOPSC showed three dimensions with higher scores in most studies. “Teamwork within the units”, “Expectations and actions to promote the safety of supervisors and managers” and “Organizational learning and continuous improvement”<sup>(8,17,23-24,28-29)</sup>.

Regarding the dimensions with the lowest percentage of positive responses, “Non-punitive responses to errors” and “Support of hospital management for patient safety” were present in most evaluations<sup>(8,17,23-24,28-29)</sup>.

The Domain of the SAQ “Satisfaction at work” was the one that obtained the highest score in most investigations that used this instrument; the domain “Perception of unit and hospital management” obtained the lowest scores<sup>(8,14,20,26)</sup>.

It is noteworthy the fact that the evaluations that applied the HSOPSC considered that managers have a more proactive attitude towards patient safety, than the evaluations that employed the SAQ, since, in the latter, the items that refer to the approval of management actions regarding safety issues reached lower scores.

Among the studies that used the HSOPSC, one aimed to systematize the recommendations of nursing professionals about patient safety in two ICUs. Most of the recommendations found were not associated with the dimensions that obtained the worst evaluations of most studies. There were a greater number of recommendations for the dimensions “Organizational learning and continuous improvement”, “Professionals” and “General perception of patient safety”<sup>(25)</sup>.

In an investigation that applied semi-structured interviews, two categories emerged: “Perception of error” and “Error management”. In these, professionals recognized the possibility of error in health care, attributing its occurrence to both individual failures and system failures. Thus, they defended fair culture to the detriment of punitive culture<sup>(2)</sup>.

This result also differs from the evaluations from the HSOPSC, in which the professionals feared the punitive culture and believed that it still permeated the management of problems related to patient safety.

### *Patient safety culture in intensive care and associated factors*

The examination of the publications allowed knowing the determinants of the patient safety culture, which point to possible improvement interventions necessary for promoting a safer environment.

Burnout Syndrome is associated with lower perceptions of the patient safety culture in a study that used the SAQ<sup>(12)</sup>. Likewise, a research conducted by the HSOPSC identified an association between a positive safety culture and the absence of Burnout. This association is due to the fact that this syndrome decreases the commitment to work and, consequently, the perception of patient safety becomes less sensitive<sup>(28)</sup>. Thus, preventive measures of this condition in health professionals can help develop a stronger safety culture.

Other characteristics of the professionals were also associated with the patient safety culture, such as working time in the hospital, working time in the unit, professional category and gender. Individuals with less than one year of work in the hospital and in the unit, medical professionals and men tended to have a higher percentage of positive responses in the evaluations<sup>(15,22)</sup>. In addition, ICU size was identified as a determining factor of safety culture scores, since smaller ICUs were related to better results in investigations<sup>(15)</sup>.

A research that applied the HSOPSC before and after the restructuring of units that underwent merger of different ICUs corroborates this understanding, and noted that the restructuring was negatively associated with the change in the safety culture, in particular the dimensions related to the unit<sup>(13)</sup>.

Another determining factor was the safety rounds, in which the feedback from these was

associated with better safety culture results. Safety rounds create spaces for dialogue between leaders and the frontline team to identify risks and collect information in order to improve processes around patient safety<sup>(18)</sup>.

Training and qualifications related to patient safety was also associated with better results in safety culture assessments in both those measured by the SAQ and with the HSOPSC<sup>(27,29,31)</sup>. However, the dimensions “non-punitive responses to errors” in one study<sup>(31)</sup>, and “frequency of reported events” in two studies are highlighted<sup>(29,31)</sup>, did not improve significantly with this intervention, suggesting that the notification of safety problems and the way employees feel about their mistakes are even more complex.

The patient safety culture was also associated with important clinical outcomes. A study that used the SAQ found that, for every 10% drop in the percentage of positive ICU scores for management perceptions, the increased chance of death was 1.24 ( $p=0.005$ ). In addition to this finding, for every 10% reduction in the percentage of the positive score of the ICU safety climate, the length of stay increased by 15% ( $p=0.03$ )<sup>(19)</sup>.

Another outcome associated with the safety culture was catheter-related infections. An American investigation, which applied HSOPSC at the beginning and after the implementation of measures to reduce such infections, found no association between the results of the evaluation and the rates of bloodstream infection associated with central venous catheter and urinary tract infection associated with bladder catheter<sup>(16)</sup>.

On the other hand, a study that also applied the HSOPSC and investigated the relationship between climatic patient safety profiles in the ICU and blood flow infection rates associated with the central venous catheter found different results. The investigation showed that ICUs with conflicting climates (local leadership and frontline team that did not realize the commitment of organizational management and other units to patient safety) had a significantly higher risk of this type of infection compared to ICUs that presented a generative leadership climate (high

levels of support from hospital management to patient safety and collaboration between units were perceived as a priority)<sup>(21)</sup>.

Therefore, it is evident that changes in the safety culture are able to reduce the risks of undesirable events, generating better results and outcomes in health care.

The fact that only three publication search portals were used constitutes a limitation of the study, since other investigations on the subject may not have been included in this review.

## Conclusion

The implementation of the safety culture is essential in the context of critical care and frequent evaluations are indispensable for its solidification. For this, there are instruments available allowing the identification of areas with positive aspects and areas that need improvement.

Of the studies that demonstrated the descriptive results of the evaluations, none presented a positive patient safety culture. Two dimensions, at most, were considered areas of power for safety. This demonstrates the difficulty to build a local safety culture in intensive care units, and the many efforts needed to achieve this. This fact raises the need for health services to perform safety culture assessments in order to know their weaknesses and to outline effective interventions. Furthermore, it encourages reflecting on the urgency of approaching patient safety in the curricula of educational institutions, training professionals prepared for the development of positive safety cultures.

The present investigation revealed as factors associated with the safety culture, aspects such as burnout syndrome, time working in the hospital, working time in the unit, professional category, gender, ICU size, restructuring of units, feedback of safety rounds and training and qualification. In addition, results of safety culture assessments were associated with important clinical outcomes, such as mortality, length of stay, and infections related to catheter use.

It is important that more studies be conducted to know other determinants, as well as to deepen

the knowledge of those already known, with a view to achieving the patient safety culture, promoting safe and quality care.

### Collaborations:

1 – conception, design, analysis and interpretation of data: Nathália Dantas Farias Kruschewsky and Kátia Santana Freitas;

2 – writing of the article and relevant critical review of the intellectual content: Nathália Dantas Farias Kruschewsky, Kátia Santana Freitas and Aloísio Machado da Silva Filho;

3 – final approval of the version to be published: Nathália Dantas Farias Kruschewsky, Kátia Santana Freitas and Aloísio Machado da Silva Filho.

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