

RESEARCH ARTICLE (ORIGINAL) 

Perioperative nurses' perceptions of the practices to promote a safe surgical Environment

Perceção das práticas do enfermeiro de perioperatório na promoção de um ambiente cirúrgico seguro

Percepción de las prácticas del personal de enfermería perioperatorio en la promoción de un entorno quirúrgico Seguro

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Abstract

Background: Perioperative nurses should base their practices on the best evidence to promote safety and quality of care.

Objective: To determine nurses' perceptions of the safety climate, as well as to identify and analyze practices that promote a safe surgical environment.

Methodology: Quantitative, descriptive, and correlational study with a convenience sample. Data were collected through a questionnaire applied to perioperative nurses.

Results: The findings revealed a positive perception of the safety climate. The commitment to maintaining a safe environment is associated with a greater perception of working conditions. Good practices include Prevention of wrong-site, wrong-procedure, and wrong-patient surgery; Hand hygiene; Medication safety; Surgical environment; Patient positioning, and Transfer to the Post-Anesthesia Care Unit (PACU).

Conclusion: It is essential to invest in practices that promote the quality and safety of nursing care and promote surgical awareness.

Keywords: perception; environment; safety; perioperative period; nurses

Resumo

Enquadramento: O enfermeiro de perioperatório deve alicerçar a sua prática na melhor evidência para promover cuidados seguros e de qualidade.

Objetivos: Identificar a perceção do enfermeiro sobre o clima de segurança; e identificar e analisar as práticas promotoras de um ambiente cirúrgico seguro.

Metodologia: Estudo quantitativo, descritivo e correlacional, com amostra por conveniência. Os dados foram recolhidos através de um questionário aos enfermeiros de perioperatório.

Resultados: Os resultados identificaram uma perceção positiva do clima de segurança. Constatou-se que o empenho na manutenção do ambiente seguro está ligado a uma maior perceção das condições de trabalho. São boas práticas - Prevenção da cirurgia do local errado, procedimento errado e utente errado; Higienização das mãos; Segurança do medicamento; Ambiente operatório; Posicionamento do doente; e Transferência para a Unidade Cuidados pós Anestésicos.

Conclusão: É imperativo apostar numa práxis promotora da qualidade e segurança no sentido da valorização dos cuidados de enfermagem, promovendo a consciência cirúrgica.

Palavras-chave: perceção; ambiente; segurança; período perioperatório; enfermeiros

Resumen

Marco contextual: El personal de enfermería perioperatorio debe basar su práctica en la mejor evidencia para promover unos cuidados seguros y de calidad.

Objetivos: Identificar las percepciones del personal de enfermería sobre el clima de seguridad e identificar y analizar las prácticas que promueven un entorno quirúrgico seguro.

Metodología: Estudio cuantitativo, descriptivo y correlacional con una muestra de conveniencia. Los datos se recogieron mediante un cuestionario para el personal de enfermería perioperatorio.

Resultados: Los resultados identificaron una percepción positiva del clima de seguridad. Se constató que el compromiso de mantener un entorno seguro está vinculado a una mayor percepción de las condiciones de trabajo. Las buenas prácticas son las siguientes: Prevención de intervenciones quirúrgicas en lugares erróneos, procedimientos erróneos y pacientes erróneos; Higiene de las manos; Seguridad de los medicamentos; Entorno quirúrgico; Posicionamiento del paciente, y Traslado a la Unidad de Cuidados Posanestésicos.

Conclusión: Es imprescindible invertir en una práctica que promueva la calidad y la seguridad para mejorar los cuidados de enfermería, fomentando así la conciencia quirúrgica.

Palabras clave: percepción; ambiente; seguridad; período perioperatorio; enfermeros

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Introduction

The operating room (OR) is one of the most complex healthcare environments. Considered the ‘heart’ of any large hospital, its complexity and specificity are suited to the need for safety, the procedures, and the costs arising from the activities performed (Direção-Geral da Saúde [DGS], 2015; Medeiros & Filho, 2017).

The concept of safety has taken on great importance and is a major concern for healthcare organizations. The World Health Organization (WHO) recommends clear policies, leadership capacity, implementation of patient safety strategies, skilled healthcare professionals, and patient involvement (World Health Organization [WHO], 2019). By implementing best practices and appropriate safety measures for each procedure, perioperative nurses facilitate decision-making to ensure strategies that promote a safe surgical environment.

A quantitative, descriptive, and correlational study was conducted in a public hospital in order to interpret and reflect on the results and draw conclusions and possible recommendations to guide nurses’ practices in promoting a safe surgical environment and, consequently, improving health care. This study aimed to determine perioperative nurses’ perceptions of the safety climate; identify and analyze perioperative nurses’ practices that promote a safe surgical environment based on the guidelines of the Portuguese Operating Room Nurses Association (AESOP); and analyze the practices that promote a safe surgical environment according to the roles of perioperative nurses.

Background

Perioperative nursing requires specialized nurses with the knowledge and skills to assess, diagnose, plan, intervene and evaluate the outcomes of interventions before, during, and after surgery (European Operating Room Nurses Association [EORNA] 2019). The goal is to maximize safety for both the patient and the multidisciplinary team in line with surgical awareness (Regulamento nº 429/2018 do Ministério da Saúde, 2018).

Perioperative nursing care should be based on theoretical frameworks, that is, professional practice models that foster environments that promote quality care, namely in communication, autonomy, teamwork, shared management, and strengthening the commitment to the organization and the profession (Ribeiro et al., 2016).

In recent years, the quality of care has become a major issue in patient safety (Organização Mundial da Saúde [OMS], 2019). The Association of periOperative Registered Nurses (APRN, 2020), in its ‘Guidelines for Perioperative Practice’, provides a set of recommendations based on the latest evidence to ensure excellence in perioperative care. In clinical practice, perioperative nurses can play supportive roles in anesthesia, circulation, instrumentation, and the Post-Anesthesia Care Unit (PACU). Although these roles are distinct, they are complementary (AESOP, 2013).

According to the Portuguese Nursing Board (Ordem dos Enfermeiros [OE], 2018), nurses should “manage the environmental circumstances that increase the likelihood of adverse events associated with the administration of therapeutic processes in the various contexts of activity” (p. 19361) and promote “innovative clinical and non-clinical risk prevention strategies aimed at creating a safety culture, in the various contexts of activity” (p. 19362). Saraiva and Almeida (2017) argue that safety climate is a field of study that assesses, plans, and monitors safety programs based on the perceptions of healthcare professionals, in order to promote safer care towards excellence. A study conducted by Bernalte-Martí (2022) in Spain and Italy concluded that OR professionals have a positive attitude towards patient safety, which reflects the team’s perception of the characteristics and ‘good’ practices in the OR.

Safety culture is the product of individual and group values, attitudes, perceptions, skills, and patterns of behavior which lead to commitment, style, and ability in the management of the safety of a health organization (Organização Mundial da Saúde [OMS], 2009). Because this environment is complex, fast-paced, unique, and often unpredictable, nurses’ critical thinking skills enable them to provide effective care, evolve an safe ever-changing environment (Jung et al., 2020).

Research question

Do perioperative nurses’ practices promote a safe surgical environment?

Methodology

This is a quantitative, descriptive, and correlational study. The issue addressed in this study is the safety of the surgical environment in the OR. This is justified because safety is an integral part of the OR, which is a functional unit where there should be no failures in the operational dynamics, the facilities, and the maintenance of safety and its material and human resources.

A non-probability sample was selected using the following inclusion criteria: working in the area of care under study and having been integrated into the perioperative area for six months. The conceptual model identifies the safety of the surgical environment as the main variable to be studied. Data were collected through a self-administered questionnaire applied to the nurses. The questionnaire consisted of two parts: the first part aimed at the nurses’ sociodemographic and professional characterization, while the second part consisted of two sets of questions. The first set consisted of the Safety Attitudes Questionnaire (SAQ) - Short Form 2006, which assesses nurses’ perceptions of patient safety. It is a valid and reliable instrument, validated for the Portuguese population by Saraiva and Almeida in 2017 with a Cronbach’s alpha of 0.92 and a Pearson correlation coefficient for test-retest of 0.99. The SAQ has six dimensions, divided into 36 questions



scored from 1 to 5 points, with a maximum score of 100 points. A score of 75 points indicates a strong safety climate. The second set of 75 questions was built based on an observation grid developed by Ângelo (2015) and on the AESOP Recommended Practices for Operating Rooms (2013). The 75 questions were grouped into areas of action for perioperative nurses: Prevention of wrong-site, wrong-procedure, and wrong-patient surgery; Hand hygiene; Medication safety; Surgical environment; Maintenance of surgical aseptic technique; Commitment to maintaining a safe environment in the operating room; Patient positioning; Electrosurgical unit; Pneumatic tourniquet; Counting of sponges and materials; Counting and recording of instruments; Counting and recording of sharps and; If sponge counting is incorrect; and Transfer to the PACU. The respondents used a five-point Likert scale: *not applicable*; *rarely*; *occasionally*; *frequently*; *always*. The *not applicable* option is related to the distribution of the nursing tasks in force at the OR where the study took place.

Data were collected between December 2020 and February 2021.

The data collection instrument was given to all the nurses in the OR where the study took place, and after completion, was placed anonymously in a box. Data were processed using IBM SPSS Statistics, version 25.0. After testing for normality, non-parametric tests were used: the Kruskal-Wallis test to compare more than two groups and Spearman's correlation to check the relationship between variables. Results with a significance level of less than 0.05 were considered statistically significant. All ethical and legal procedures were followed. Approval was sought from the board of directors of the hospital where the study was conducted, and an opinion was sought from the ethics committee.

Results

The sample consisted of 75 nurses, of whom 33.3% ($n = 25$) had been working in the perioperative area for five years or less and 32% ($n = 24$) for 21 years or more. In addition, 48% ($n = 36$) of the nurses performed all perioperative tasks, 21.3% ($n = 16$) worked only as circulators and scrub nurses, and 30.7% ($n = 23$) worked only as anesthesia and PACU support nurses.

The descriptive analysis of the Portuguese version of the SAQ - Short Form 2006 and its dimensions revealed nurses' perceptions of the safety climate in this OR.

The SAQ consists of 36 items, with a minimum score of 1 point and a maximum score of 5 points per item. Descriptive analysis was performed by calculating the answers to the 36 items and the mean of the answers, after inverting items 2, 11, and 36. The majority of nurses answered *agree slightly* and *agree*. Concerning the dimensions, the most significant results were analyzed taking into account the sum of the agreement values. In the Teamwork climate dimension, 89.4% of the sample stated that they have the support they need from other personnel to care for patients. With regard to the Safety climate, 94.6% of the sample responded that they would feel safe undergoing surgery in the department. In the Job satisfaction dimension, it should be noted that all nurses (100%) agreed with the question '*I like my job*'. As for Stress recognition, 86.7% of the nurses reported that they were less effective when fatigued. As regards the Perceptions of management, the majority of nurses (89.3%) reported that their manager did a good job. With regard to the Working conditions dimension, 69.3% reported that they routinely receive information for diagnostic and therapeutic decisions (Table 1). Item 33 showed that 80% ($n = 60$) of the nurses agreed that there was effective collaboration within the nursing team.

Table 1

Results of the frequency of answers to the SAQ (N = 75)

	Item	N	C (%)
Teamwork climate	4	67	89.4%
Safety climate	7	71	94.6%
Job satisfaction	15	75	100%
Stress recognition	21	65	86.7%
Perceptions of management	26	67	89.3%
Working conditions	31	52	69.3%

Note. N = Absolute frequency, C = Agreement answers.

In order to determine nurses' perceptions of the safety climate, scores were calculated for the six dimensions of the SAQ. Scores above 75 were considered to be significant for nurses' strong agreement with patient safety issues, reflecting a positive safety climate (Sexton et al., 2006). However, although the *not applicable* option was considered data because it was significant for the instrument,

it was not included in the calculations of the mean and total scores and their dimensions. The mean total SAQ score was 70.40, indicating a positive perception, although it was below the desired average of 75, indicating a strong safety climate. By dimension, the means ranged from 62.08 (Perceptions of management) to 81.16 (Job satisfaction; Table 2).

Table 2*Analysis of the SAQ dimensions (N = 75)*

Dimensions	<i>N</i>	<i>M</i>
Teamwork climate	73	70.72
Safety climate	74	68.82
Job satisfaction	73	81.16
Stress recognition	75	74.00
Perceptions of management	72	62.08
Working conditions	73	65.58
SAQ TOTAL		70.40

Note. *N* = Absolute frequency, *M* = Mean.

Nurses' practices to promote a safe surgical environment were assessed using 73 items divided into 15 areas of activity. There was a high frequency of practices in five areas of activity (Table 3). In area 1, 'Prevention of wrong-side, wrong-procedure, and wrong-patient surgery', 90.75% of participants answered 'always' to the item 'Confirmation of patient identity'. In area 2, 'Hand hygiene', 94.7% of nurses reported that they always disinfect their hands after the risk of exposure to organic fluids, non-intact skin, or dressings. Area 3, 'Medication safety', is identified as a safe practice, with percentages of responses consistent across all items (labeling, dose, and route of administration of medication). In area 4, 'Surgical environment', 98.7% of responses were positive, with 72% of nurses reporting that they always checked the availability and functioning of the equipment and items before surgery.

In Area 7, 'Patient positioning', 70.7% of nurses reported that they always respect the patient's privacy and individuality. Area 14, 'Transfer to the PACU', stands out as an extremely important moment in care, with the vast majority of nurses answering *often* and *always*. It should be noted that these areas of activity received the highest number of *always* responses, with a mean score higher than 4. These results confirm that the practices carried out in these areas promote a safe surgical environment. Table 3 shows the mean scores for each area of activity. Area 12, 'Counting and recording of sharps', had the lowest mean score (3.69), while area 1, 'Prevention of wrong-site, wrong-procedure and wrong-patient surgery', had the highest mean score (4.77). The total mean score for the 73 items on the perception of the frequency of perioperative nurses' practices was between *often* and *always* (4.18).

Table 3*Analysis of the areas of activity of perioperative nurses*

	<i>M</i>	<i>SD</i>
1. Prevention of wrong-site, wrong-procedure and wrong-patient surgery	4.77	0.491
2. Hand hygiene	4.75	0.403
3. Medication safety	4.59	0.709
4. Surgical environment	4.60	0.562
5. Maintenance of the surgical aseptic technique	3.82	1.356
6. Commitment to maintaining a safe environment in the operating room	3.83	0.959
7. Patient positioning	4.59	0.549
8. Electrosurgical Unit	3.88	1.381
9. Pneumatic tourniquet	3.85	1.365
10. Counting of sponges	4.04	1.596
11. Counting and recording of instruments	3.75	1.676
12. Counting and recording of sharps	3.69	1.695
13. If sponge counting is incorrect	4.12	1.614
14. Transfer to the PACU	4.54	0.679
15. Identification of surgical samples/specimens	3.92	1.436
<i>Total</i>	4.18	1.098

Note. *M* = Mean, *SD* = Standard deviation.



Spearman's correlation was used to check the relationship between the SAQ dimensions and nurses' practices (Table 4). Three areas of activity showed a highly significant positive correlation ($p < 0.01$) with three SAQ dimensions. Area 4 - Surgical environment - shows a highly significant positive correlation ($r_s = 0.318$; $p = 0.006$) with the Safety climate dimension, that is, the practices of checking the conditions of the surgical environment

increase as the professionals' perception of safety in the OR increases. The same is true for area 6 - Commitment to maintaining a safe environment in the operating room, which had a highly significant positive correlation ($r_s = 0.338$; $p = 0.003$) with dimension 6 - Working conditions. Thus, the nurses who most frequently checked the safety conditions in the OR had a greater perception of the conditions in which they worked.

Table 4

Results of the Spearman's correlation test between SAQ dimensions and perioperative nurses' practices

	1.Teamwork climate	2.Safety climate	3.Job satisfaction	4.Stress recognition	5.Perceptions of management	6.Working conditions
Area of activity 1	-0.011	0.277*	-0.070	-0.180	0.078	0.273*
Area of activity 2	0.036	0.227	0.050	-0.065	0.059	0.019
Area of activity 3	0.005	0.245*	0.162	-0.186	0.270*	0.179
Area of activity 4	0.203	0.318**	0.137	-0.065	0.205	0.206
Area of activity 5	-0.080	0.086	-0.045	-0.061	0.123	0.161
Area of activity 6	0.194	0.259*	0.093	-0.078	0.187	0.338**
Area of activity 7	0.159	0.158	0.206	-0.050	0.054	0.161
Area of activity 8	-0.142	0.003	-0.135	-0.115	-0.011	0.128
Area of activity 9	-0.159	0.069	-0.073	-0.096	0.036	0.192
Area of activity 10	-0.183	-0.059	-0.233*	-0.132	-0.084	0.143
Area of activity 11	-0.226	-0.101	-0.260*	-0.107	-0.018	0.062
Area of activity 12	-0.094	0.053	-0.232*	-0.091	-0.024	0.154
Area of activity 13	-.267*	-0.077	-0.289*	-0.091	0.010	0.052
Area of activity 14	0.002	0.070	0.104	-0.175	-0.004	0.051
Area of activity o 15	-0.077	0.132	-0.139	-0.367**	0.019	0.166
	71	72	71	73	70	73

** Correlation is significant at 0.01 (two-tailed).

* Correlation is significant at 0.05 (two-tailed).

Discussion

The sample revealed that 32% ($n = 24$) of the nurses had been working in the perioperative area for 21 years or more and that 57.3% (43) had been working in the OR where the study took place for more than 10 years, indicating that they are an expert and experienced team in this area of care. Angelo (2015) also found that 42% of nurses had 16 years or more of experience in the perioperative area, while Bernalte-Martí (2022) found that 42.1% of the sample had worked in the OR for more than 10 years. The analysis of the results of the SAQ showed that the majority of nurses answered *agree slightly* and *agree*. These results are confirmed by Saraiva and Almeida (2017). It should be noted that a result of 96% was obtained in the Safety climate dimension with the question 'I would feel safe being treated here as a patient'. In the Job satisfaction dimension, 100% of the sample answered 'I like my job' and 97.3% agreed that this OR was a good place to work. It can be assumed that the nurses in the OR where the

study took place perceive a safe environment. The result shows a total mean score of 70.40, indicating a positive perception of the safety climate, which is more significant than that obtained by Saraiva and Almeida (2017), who found a mean score of 67.03.

The practices of perioperative nurses were the focus of this study, and it was about them that the last part of the data collection instrument asked. The results show that there are lines of discussion that lead us to consider these practices carried out in these five areas as good practices, due to the fact that there was a high frequency of 'Prevention of wrong-side, wrong-procedure, and wrong-patient surgery'. This result is in line with the 'Guidance on the Unequivocal Identification of Patients, which requires nurses to confirm the patient's identity based on reliable data (DGS, 2011). The results also suggest that the first objective of the 'Safe Surgery Saves Lives' checklist - 'The team will operate on the correct patient at the correct site' - was clearly met.

With regard to 'Hand hygiene', the observational study

carried out by the institution's Quality Office in 2020 confirmed the results on hand hygiene compliance in the operating room, showing that 89.2% of nurses complied with correct hand hygiene (GCL-PPCIRA, 2021).

'Medication safety' was reinforced by the adoption of structural and procedural preventive measures for the safe use of medications (Despacho n.º 1400-A/2015), namely when nurses labeled the dose and route of administration. The perception of the practice of checking the 'Surgical environment' is corroborated by Ângelo (2015), who found that nurses performed 87% to 97% of safe practices related to environmental conditions to minimize risks during the perioperative period (Gutierrez et al., 2018). 'Patient positioning' is a key element for successful surgery (AESOP, 2013). Surgical patients are at increased risk for pressure injuries due to both the duration of surgery and the surgical surface (Arqueiro, 2021).

The 'Transfer to the PACU' stands out as an extremely important moment of care, thus meeting Objective 9 of the "Safe Surgery Saves Lives" checklist, which states that the team must effectively communicate and exchange critical patient information that contributes to increasing the safety of surgical procedures (WHO, 2009).

A positive correlation was found between Area 4 - 'Surgical environment' and the Safety climate dimension, that is, the frequency of nurses' practices increases as their agreement with the safety climate increases. Saraiva and Almeida (2017) also concluded that the vast majority (88.5%) of health professionals were aware of the appropriate means to address issues related to patient safety, but only 64.7% of them mentioned the culture in the department as one that encourages learning from mistakes. A significant positive correlation was found between Area 6 - 'Commitment to maintaining a safe environment in the operating room' and dimension 6 - Working conditions. Nurses who are most often involved in maintaining the OR environment have the highest perception of working conditions. This association is considered reliable because a safe environment is the sum of individual and team attitudes, perceptions, skills, and patterns of behavior that, along with continuous training, are the source of the quality of the environment in the OR (OMS, 2009; Antunes, 2020).

The limitations of this study are those inherent to the pandemic times in 2020/21, namely the lack of time to conduct the study due to the strenuous pace of hospital work.

Conclusion

Nurses had positive perceptions of the safety climate. The majority of them agreed that they work in a unit where there is good cooperation among team members. They showed commitment to the unit and their leadership was recognized and respected by the group. The nurses were unanimous in their positive responses to the questions 'I like my job' and 'This team is a good place to work.' The results of the questionnaire on nurses' practices show that the practices in the areas of "Prevention of wrong-site,

wrong-procedure, and wrong-patient surgery", "Hand hygiene", "Medication safety", "Surgical environment", "Patient positioning", and "Transfer to the PACU" are good practices because they had the highest percentage of *always* responses, with a mean score of more than 4. As a result, they show that they not only improve the quality of the environment but also patient safety.

It can be concluded that the frequency of nurses' practices increases in line with their agreement with the safety climate. Nurses who are most often involved in maintaining the environment of the OR have the highest perception of working conditions.

This study opened a space for reflection/action on concepts that are at the heart of the humanization of care. The results of this study are expected to contribute to assessing practices and attitudes, improving patient and environmental safety, promoting surgical awareness, and valuing nursing as a discipline of knowledge.

Author contributions

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