

Implementation of a surgical safety checklist in Brazil: cross-sectional study

Implementação de checklist de segurança cirúrgica no Brasil: estudo transversal

Implementación de la lista de verificación de seguridad quirúrgica en Brasil: estudio transversal

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ABSTRACT

Objective: to identify the implementation process of the World Health Organization Surgical Safety Checklist in Brazilian hospitals. **Methods:** this is a cross-sectional study with 531 participants during a Congress of Perioperative Nursing, promoted by the Brazilian Association of Operating Room Nurses, Anesthetic Recovery and Material and Sterilization Center, in 2017. **Results:** among the nursing professionals included, 84.27% reported the checklist implementation in the workplace. Regarding daily application in the Sign-in stage, 79.65% of professionals confirmed patient identification with two indicators; in the Time-out stage, 51.36% of surgeries started regardless of confirmation of one of the items. In the Sign-out stage, 69.34% of professionals did not count or occasionally counted the surgical instruments and suture needles, and only 36.36% reviewed concerns about postoperative recovery. **Conclusion:** this study identified needs for improvements in applying the checklist in the Brazilian reality, to guarantee safer surgical procedures.

Descriptors: Nurses; Patient Safety; Checklist; Perioperative Care; Risk Management.

RESUMO

Objetivo: identificar o processo de implantação da Lista de Verificação de Segurança Cirúrgica da Organização Mundial da Saúde em hospitais brasileiros. **Métodos:** estudo transversal com 531 participantes durante um Congresso de Enfermagem Perioperatória, promovido pela Associação Brasileira dos Enfermeiros de Centro Cirúrgico, Centro de Recuperação Anestésica e Material e Esterilização, em 2017. **Resultados:** dentre os profissionais de enfermagem incluídos, 84,27% relataram a implantação do checklist no ambiente de trabalho. Em relação à aplicação diária na etapa Sign-in, 79,65% dos profissionais confirmaram a identificação do paciente com dois indicadores; na etapa Time-out, 51,36% das cirurgias foram iniciadas independentemente da confirmação de um dos itens. Na etapa Sign-out, 69,34% dos profissionais não contaram ou ocasionalmente contaram os instrumentos cirúrgicos e agulhas de sutura. Apenas 36,36% revisaram preocupações sobre a recuperação pós-operatória. **Conclusão:** este estudo identificou necessidades de melhorias na aplicação do checklist na realidade brasileira, para garantir procedimentos cirúrgicos mais seguros.

Descritores: Enfermeiras e Enfermeiros; Segurança do Paciente; Lista de Checagem; Assistência Perioperatória; Gestão de Riscos.

RESUMEN

Objetivo: identificar el proceso de implementación de la Lista de Verificación de Seguridad Quirúrgica de la Organización Mundial de la Salud en los hospitales brasileños. **Métodos:** estudio transversal con 531 participantes durante un Congreso de Enfermería Perioperatoria, promovido por la Asociación Brasileña de Enfermeras del Centro Quirúrgico, Centro de Recuperación y Esterilización de Anestesia y Material, en 2017. **Resultados:** entre los profesionales de enfermería incluidos, el 84,27% informó la implementación de la lista de verificación en el lugar de trabajo. En cuanto a la aplicación diaria en la etapa de Sign-in, el 79,65% de los profesionales confirmaron la identificación del paciente con dos indicadores; en la etapa de Time-out, el 51,36% de las cirugías se iniciaron independientemente de la confirmación de alguno de los ítems. En la etapa de Sign-out, el 69,34% de los profesionales no contaba u ocasionalmente el instrumental quirúrgico y las agujas de sutura. Solo el 36,36% revisó las preocupaciones sobre la recuperación postoperatoria. **Conclusión:** este estudio identificó necesidades de mejoras en la aplicación del checklist en la realidad brasileña, para asegurar procedimientos quirúrgicos más seguros.

Descritores: Enfermeros y Enfermeras; Seguridad del Paciente; Lista de Verificación; Atención Perioperativa; Gestión de Riesgos.

INTRODUCTION

The number of surgeries has progressively increased over the years, with an estimated 312,93 million procedures worldwide⁽¹⁾. In this context, the operating room (OR) is a complex environment in which professionals need to work in teams to guarantee care quality and safety of for patients⁽²⁾.

Faced with morbidity and mortality rates associated with surgeries, in 2008, the World Health Organization (WHO) launched the "Safe Surgery Saves Lives" program, which proposed applying a three-step surgical safety checklist (Sign-in, Time-out, and Sign-out). Before beginning the surgery, the steps include checking the materials and equipment required, patients' airway conditions prior to anesthesia, staff member confirmation, critical moments of the anesthetic-surgical procedure, and antibiotic prophylaxis. Before leaving the OR, the steps included verifying possible failures occurred during the procedure, anatomopathological sample, review of patients' needs for postoperative recovery, as well as gauze, compress and needle count⁽³⁾.

In 2013, the Brazilian Ministry of Health approved a protocol for safe surgery, which guides the application of a checklist in all health establishments that perform procedures, inside or outside the OR, involving an incision in the human body or introduction of endoscopic equipment by any health professional. This action was aimed at preventing and reducing the incidence of adverse events, enhancing patient safety assurance⁽⁴⁻⁵⁾.

It should be emphasized that applying the checklist in health institutions reduces the number of postoperative complications, such as surgical site infection and reoperation, as well as a decrease in mortality associated with the surgical procedure⁽⁶⁻⁷⁾. Additionally, application of the checklist during surgery improved communication among professionals and increased safety perception related to the provided care^(2,8).

Thus, the Brazilian Association of Operating Room Nurses, Anesthetic Recovery and Material and Sterilization Center (SOBECC - *Sociedade Brasileira de Enfermeiros de Centro Cirúrgico, Recuperação Anestésica e Centro de Material e Esterilização*) develops a mission of collaborating with technical-scientific development and dissemination of best practices for perioperative nursing in Brazil, sought to identify the WHO Surgical Safety Checklist implementation by nursing staff members in different hospitals in Brazil.

OBJECTIVE

This study aims to identify the implementation process of the WHO Surgical Safety Checklist in Brazilian hospitals.

METHODS

Ethical aspects

Nursing professionals attending the event and who worked at an OR were invited to participate in the study, and they agreed after signing the Informed Consent Form (ICF). The study was approved by a Research Ethics Committee.

Study design, setting and sample

This is a quantitative and cross-sectional study. Data collection was performed in September 2017 during the 13th Brazilian Congress of Nursing in Operating Room, Anesthetic Recovery, Anesthetic Recovery and Material and Sterilization Center, conducted by SOBECC.

A non-probability sampling of nursing professionals was selected, with an inclusion of 531 nurses.

Data collection

We used an instrument composed of 20 closed questions based on the WHO Surgical Safety Checklist to collect data. Moreover, sociodemographic characteristics and professional data were collected. The instrument was submitted to face and content validity by three experts on perioperative nursing. The experts agreed with the content proposed and made minor rephrasing suggestions.

A pilot test was conducted with ten subjects prior to the actual collection period and not included in the final analysis sample, to verify the suitability of the instrument and the proposed collection method. On this occasion, minor adjustments were made in the question formulation, to improve comprehension.

The research subjects were guided into an auditorium, and the instrument questions were projected on a screen. Participants could select the answer of their choice through an electronic voting system, which released preliminary results after a 60-second voting period. The information from this research served as a guide for further discussions at the event, with OR and quality experts.

Data analysis

Data were analyzed descriptively and utilizing absolute numbers and percentages.

RESULTS

The number of respondents varied between 531 and 280 subjects among the responses received per item, and so, the number of responses received for each assessed item is presented in the following tables.

Table 1 shows that participants came from all regions of the country, with emphasis on the Southeast (54.8%). They were between 31 and 40 years old (45.4%) and worked in an OR between one and five years (31.3%) (Table 1).

Among the assessed professionals, 51.18% reported working at a large institution, 34.05% of institutions were private, and 58.70% of sites did not have quality accreditation (Table 2).

Overall, 84.27% of participants reported implementing the WHO Surgical Safety Checklist, and 74.1% of professionals made changes in the material proposed by WHO.

Concerning the execution of items per step, according to the WHO proposal, it was observed in the Sign-in stage that none of the assessed items was fully verified, as can be seen in Table 3.

For the Time-out stage, it was found that this stage is performed mostly (74.77%) by a nursing assistant or technician, a professional characterized as circulating in the room, and that nurses are the ones who perform this step in only 24.08% of situations.

Table 1 – Sociodemographic characteristics, according to professional category, working region, age and working time in an operating room, Brazil, 2017

Variables	n	%
Professional category (n= 508)		
Nursing assistant	1	0.19
Nursing technician	20	3.93
Nurse	487	95.86
Working region (n=403)		
Northeast	50	12.40
North	20	4.96
Southeast	223	55.33
South	68	16.87
Center-west	42	10.42
Age (n=476)		
21-30	114	23.95
31- 40	216	45.38
41-50	87	18.28
51 -60	48	10.08
> 60	11	2.31
Working time in operating room (n=531)		
< 1 year	67	12.62
1-5 years	166	31.26
6-10 years	127	23.92
11-15 years	74	13.94
16-20 years	38	7.16
21-25 years	32	6.03
> 26 years	27	5.08

Table 2 – Distribution of participants according to organization size, profile and accreditation, Brazil, 2017

Variables	n	%
Size (n=508)		
Small (up to 50 beds)	48	9.45
Medium (51-150 beds)	137	26.97
Large (151-500 beds)	260	51.18
Extra Large (501 or more)	63	12.40
Profile (n=514)		
Philanthropic	123	23.93
Public	170	33.07
Private	175	34.05
Mixed	46	8.95
National/International Accreditation (n=523)		
Yes	216	41.3
No	307	58.7

In the Time-out stage, more than half of the sample stated that the presence of all staff members is only occasionally confirmed, and that the surgery is occasionally started without confirmation of one of the Time-out items for 51% of the sample. Patient identification, surgical site and procedure before its onset occur only occasionally in 46.09% of the sample (Table 4).

In the Sign-out stage, it is noteworthy that although 39.54% of professionals occasionally perform surgical instrument and suture needle counts, the most report always performing the counting of compresses and gauzes. As for postoperative management and recovery concerns of patients, 50.51% of participants occasionally review these concerns with an anesthesiologist (Table 5).

When questioned about the importance of implementing the checklist, 393 (99.49%) professionals believe that applying checklist increases the safety of patients undergoing surgeries. However, when completing the checklist, only 52 (13.27%) believed that they implemented 100% of the steps and items; 174

(44.39%) considered that they reached 80%; 98 (25%) achieved 60% completeness of the checklist; 36 (9.18%) reached 40%; 32 (8.16%) only reached 20% completeness.

Table 3 – Frequency of verifying and completing Sign-in stages according to patient identification, surgical site demarcation, allergy check, risk of blood loss and difficult airway, Brazil, 2017

Variables	n	%
Verification of patient identification with two indicators (n=511)		
Totally filled-in	407	79.65
Partially filled-in	82	16.05
Not filled-in	22	4.31
Surgical site demarcation (n=512)		
Always demarcated	202	39.45
Occasionally demarcated	226	44.14
Not demarcated	84	16.41
Allergy verification (n=511)		
Always assessed	463	90.61
Occasionally assessed	44	8.61
Not assessed	4	0.78
Risk of blood loss (n=504)		
Always assessed	318	63.10
Occasionally assessed	164	32.54
Not assessed	22	4.37
Difficult airway risk (n=506)		
Always assessed	300	59.29
Occasionally assessed	186	36.76
Not assessed	20	3.95

Table 4 – Frequency of verifying Time-out stages, presence of staff members, patient identification, surgical site and procedure; assessment of the need for specific materials and concerns with anesthesia and surgery, Brazil, 2017

Variables	n	%
Confirmation of presence of all staff members (n=449)		
Always assessed	178	40.18
Occasionally assessed	223	50.34
Not assessed	48	9.48
Confirmation of patient identification, surgical site and procedure (n=447)		
Always assessed	138	30.87
Occasionally assessed	206	46.09
Not assessed	103	23.04
Need for special materials and equipment (n=449)		
Always assessed	259	57.68
Occasionally assessed	157	34.97
Not assessed	33	7.35
Concerns about procedure and blood loss (n=449)		
Always assessed	250	57.08
Occasionally assessed	147	33.56
Not assessed	41	9.36
Confirmation of antibiotic prophylaxis prior to surgical incision (n=438)		
Always assessed	266	60.73
Occasionally assessed	136	31.05
Not assessed	36	8.22
Beginning of surgery without confirmation of any Time-out item (n=449)		
Always assessed	112	25.34
Occasionally assessed	227	51.36
Not assessed	103	23.3

Table 5 – Frequency of verifying the Sign-out steps, according to counting of instruments, needles, gauzes and compresses; identification of anatomopathological and patient concerns, Brazil, 2017

Variables	n	%
Counting surgical instruments and suture needles (n=349)		
Always assessed	107	30.66
Occasionally assessed	138	39.54
Not assessed	104	29.80
Counting compresses and gauzes (n=280)		
Always assessed	183	65.36
Occasionally assessed	74	26.43
Not assessed	23	8.21
Identification anatomopathological (n=395)		
Always assessed	360	30.66
Occasionally assessed	26	39.54
Not assessed	9	29.80
Anesthesiologist and nursing staff review concerns for patient recovery and management (n=396)		
Always assessed	144	36.36
Occasionally assessed	200	50.51
Not assessed	52	13.13

DISCUSSION

The results demonstrated that although professionals recognize the importance of applying the checklist for patient safety, incomplete application of items occurs at all stages, which may favor adverse event occurrence. In this context, since the beginning of development safe surgery checklist, literature has shown that implementation of this tool provided positive outcomes in the postoperative period. Using the safety checklist in eight health institutions showed a reduction in postoperative complications, such as surgical site infection and reoperation, from 11% to 7%, in addition to a decrease from 1.5% to 0.8% of mortality associated with the surgical procedure⁽⁹⁾.

In this regard, a retrospective study analyzing 233 cases of damage to patients, in ten years of otorhinolaryngological procedures before complete the safe surgery checklist implementation, pointed out that 84.3% of injuries were associated with the care offered, mainly being related to surgical technique, unnecessary procedures, retention of foreign bodies and infection⁽¹⁰⁾.

A survey showed that more than half of participants did not apply the checklist. The same evidence was observed in other studies, whose completeness of checklist steps varied between 34% and 68%^(7,11). Assessment of 565 surgical procedures, performed in five hospitals in England, also verified the incomplete application of the checklist. Carrying out the Time-out step occurred in 64% of procedures and the Sign-out step in 68% of surgeries⁽¹⁰⁾.

When analyzing Time-out items, staff was incomplete in 43% of procedures; in 10% of surgeries patient identification and procedure was not confirmed; in 29% of procedures there was blood loss, and in 15% of cases antibiotic prophylaxis was not assessed. At the Sign-out stage, 36% of procedures did not review concerns about recovery and management of postoperative patients⁽¹¹⁾.

Another investigation observed that the checklist's three steps were applied in only 62.1% of surgical procedures, and incomplete checklist execution was related to a 16.9% increase in the risk of complications after surgery. When analyzed individually,

the Sign-in was performed in 64.4% of procedures, Time-out, in 34.4%, and Sign-out, in 64.3% of surgeries⁽⁷⁾.

On the other hand, it should be noted that applying the checklist in the three stages proposed was associated with a lower risk of postoperative bleeding, reduced intraoperative transfusion, and a reduction in the number of infections due to antibiotic administration before surgical incision⁽¹²⁾.

Thus, it is important to mention that only implementing a safe surgery checklist does not guarantee its adequate performance, since professionals' perceptions and organizational factors can influence the appropriate use of a care tool.

The inadequate use of the checklist was associated to a lack of understanding by professionals about the stage's appropriate execution moment; the rush of surgeons to start the procedure, raising the impression that pausing for checklist delays the work development. Furthermore, not all professionals were attentive during the application time of the checklist⁽¹³⁾. On the other hand, using the safe surgery checklist improved communication and teamwork among professionals such as increased safety perception about patients, because all practitioners have the information about patients and features for care⁽¹⁴⁾.

Therefore, health organizations play a fundamental role in the educational orientation of health staff professionals, offering support for implementing care tools in daily routines and showing the importance of using safety measures⁽¹⁵⁻¹⁶⁾. The successful implementation of the checklist was associated to training and learning material promotion, leadership development for continuous monitoring and auditing the checklist use, clarity in the role of each professional in the staff and support for analyzing actual effectiveness of implementing the checklist^(13,17).

Since the daily application of the checklist in an OR has a positive impact on communication among professionals (surgeons, anesthesiologists, nurses) and safety in the OR, there are changes in the perceptions of teamwork and safety climate, thus constituting aspects that may influence a reduction in postoperative morbidity⁽²⁾.

Study limitations

This study demonstrates a limitation in absence of analyzing the causes of not completing the checklist items by professionals. Thus, it is important to develop future studies, which assess the limiting factors for correct execution of the checklist, as well as an analysis of the damage and complications generated by inappropriate use.

Contributions to nursing and health

The results of this study demonstrate a sample of the national reality, which can collaborate for implementing improvements by surgical staff, health institutions and responsible government agencies, in addition to pointing out future directions in terms of education and training to be conducted by SOBECC.

CONCLUSION

This study enabled us to identify that, despite recognizing the importance of the checklist for patient safety on the part of professionals, there are several fragile points in applying the

checklist steps for Safe Surgery in Brazilian hospital institutions, especially those related to Time-out and Sign-out.

The following were highlighted as points to be improved: surgical demarcation; organization of materials and equipment;

patient identification, surgical site and procedure confirmation; beginning surgery even though items have not been reviewed; counting of instruments and needles; and the review of postoperative concerns among the staff.

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