

IMPLEMENTATION AND DAILY USE OF THE SURGICAL SAFETY CHECKLIST IN HOSPITALS

Implementação e uso diário da lista de verificação de segurança cirúrgica em hospitais

Implementación y uso diario de la lista de control de seguridad quirúrgica en hospitales

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ABSTRACT: Objective: To identify the implementation process and the daily use of the surgical safety checklist, according to the report of nurses who worked in the surgical center of hospitals. **Method:** Descriptive-exploratory study, with a sample of 77 nurses. Data collection took place over six months in 2016, with the application of an instrument prepared and submitted to face and content validation. In the data analysis, descriptive statistics was adopted. **Results:** The realization of an educational program was essential in the process of implementing the surgical safety checklist. The circulator nurse was responsible for checking the instrument daily in the operating room. Most nurses reported partial adherence to the use of the checklist by the surgical team; there was difference in adherence between the checking stages (sign in, time out, and sign out) and between professional categories. **Conclusion:** The knowledge produced offers subsidies for the implementation of the instrument and the use of strategies that can assist in daily clinical practice. **Keywords:** Checklist. World Health Organization. Patient safety. Perioperative nursing.

RESUMO: Objetivo: Identificar o processo de implementação e o uso diário da lista de verificação de segurança cirúrgica, segundo relato de enfermeiros que atuavam no centro cirúrgico de hospitais. **Método:** Estudo descritivo-exploratório, com amostra de 77 enfermeiros. A coleta de dados ocorreu durante seis meses, no ano de 2016, por meio da aplicação de instrumento elaborado e submetido à validação de face e conteúdo. Na análise dos dados, adotou-se a estatística descritiva. **Resultados:** A realização de programa educacional foi essencial no processo de implementação da lista de verificação de segurança cirúrgica. O circulante era o responsável pela checagem diária da ferramenta na sala cirúrgica. A maioria dos enfermeiros relatou adesão parcial no uso do *checklist* pela equipe cirúrgica; houve diferença de adesão entre as etapas de checagem (entrada, pausa e saída) e entre as categorias profissionais. **Conclusão:** O conhecimento produzido oferece subsídios para a implementação da ferramenta e o uso de estratégias que podem auxiliar no cotidiano da prática clínica.

Palavras-chave: Lista de checagem. Organização Mundial da Saúde. Segurança do paciente. Enfermagem perioperatória.

RESUMEN: Objetivo: Identificar el proceso de implementación y uso diario de la lista de verificación de seguridad quirúrgica, según el informe de enfermeras que laboraron en el centro quirúrgico de los hospitales. **Método:** Estudio descriptivo-exploratorio, con una muestra de 77 enfermeros. La recolección de datos se llevó a cabo durante seis meses, en 2016, mediante la aplicación de un instrumento elaborado y sometido a validación facial y de contenido. En el análisis de los datos se adoptó estadística descriptiva. **Resultados:** La realización de un programa educativo fue fundamental en el proceso de implementación de la lista de verificación de seguridad quirúrgica. El circulador se encargaba de revisar la herramienta diariamente en el quirófano. La mayoría de las enfermeras informaron un cumplimiento parcial del uso de la lista de verificación por parte del equipo quirúrgico; hubo una diferencia en la adherencia entre los pasos de verificación (entrada, pausa y salida) y entre categorías profesionales. **Conclusión:** El conocimiento producido ofrece subsidios para la implementación de la herramienta y el uso de estrategias que pueden ayudar en la práctica clínica diaria.

Palabras clave: Lista de verificación. Organización Mundial de la Salud. Seguridad del paciente. Enfermería perioperatoria.

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INTRODUCTION

Since 2008, the Surgical Safety Checklist (*Lista de Verificação de Segurança Cirúrgica - LVSC*), developed by the World Health Organization (WHO), has been recommended to improve the safety of surgical patients.¹ After 12 years of creating this instrument, teamwork, communication, and patient safety were aspects that were improved with its use in hospitals.²

In the world context, with studies, experiences with the implementation of the LVSC were disseminated, and the results obtained indicated that the instrument was adapted and implemented in a different way among health services, with the need to integrate different strategies to improve surgical safety practices and achieve the benefits of using the checklist in different scenarios.^{3,4}

In hospitals, the implementation of LVSC consists of a complex and challenging process, as it requires surgical teams to change behaviors and learn new habits.^{5,6} Furthermore, scholars of the problem claim that, many times, the way the instrument was put into practice resulted in incomplete or inconsistent execution.⁴

In Brazil, the available scientific evidence covered knowledge, perception, and attitudes of the team, adherence and impact of the LVSC.^{7,8} However, the studies developed little explored the process of implementing the checklist.^{6,9}

Furthermore, in a literature review, the authors highlighted that, in developing countries, such as Brazil, there is a shortage of studies regarding all aspects of the use of LVSC that need to be addressed. To continuously defend LVSC as a surgical safety measure applicable to the global population, research in these countries needs to be a priority. Implementation strategies should be investigated in the context of developing countries so that hospitals can evaluate the most appropriate approach to introduce its use in a more compatible way with the local reality, in order to promote the increased use of this instrument and benefit more patients.⁹

Considering the potential of the LVSC to improve the safety of surgical patients and the need to generate evidence that can contribute to the reduction of knowledge gaps, the present study was guided by the following research question: how did the process of implementation and the daily use of the LVSC in studied hospitals?

OBJECTIVE

To identify the implementation process and the daily use of the surgical safety checklist, according to the report of nurses who worked in the surgical center of hospitals.

METHOD

This is a descriptive-exploratory study, carried out in 16 hospitals that implemented the LVSC, in two main cities in Paraná State, of which 11 are in Londrina City and 5, in Maringá City. For the selection of hospitals, the National Registry of Health Establishments (Cadastro Nacional de Estabelecimentos de Saúde - CNES) of the Brazilian Ministry of Health (MS) was consulted.

The target population was nurses working in the surgical center (SC) unit of the selected hospitals, namely: coordinating nurse or assistant nurse. Nurses who did not exclusively worked in the sector were excluded, in addition to professionals who were covering someone's time off, vacation, or any type of leave.

The population was 81 nurses working in the SC, 58 in hospitals in Londrina City and 23, in Maringá City. From the total, after applying the selection criteria, four nurses were excluded: two professionals did not agree to participate in research, one was on a medical leave, and one, on maternity leave. Thus, the sample consisted of 77 nurses, 56 in Londrina and 21 in Maringá.

An instrument developed by the researchers was used for data collection, which was submitted to face and content validity by three nurses (judges), with teaching and/or research activities in perioperative nursing. The instrument included data on the characterization of nurses, the hospital and the SC, and on the implementation and daily use of the LVSC. Data collection took place over six months in 2016.

An electronic spreadsheet was created in Microsoft Excel for data storage, and the double entry technique was adopted. The Statistical Package Social Sciences (SPSS) software version 19.0 was used for data analysis. The variables investigated were described by absolute (No.) and relative (%) frequency, arithmetic mean, and standard deviation.

The study was approved by the Ethics Committee under opinion No. 164/2015, CAAE No. 48347115.9.0000.5393, and the nurses participated by reading and signing the Free and Informed Consent Form.

RESULTS

Of the 77 nurses, most (72; 93.5%) were female; the average age was 34.6 years (standard deviation=9.5); and the length of experience in the SC was 5.6 years (standard

deviation=6.2). The majority (46; 59.7%) of participants worked in a private hospital. The average time for implementing the checklist was 27.8 months. Table 1 presents data on the process of implementing the LVSC in the selected hospitals.

As to the LVSC format, “two or more formats” of the available instrument in the operating room (OR) corresponded to the highest percentage (35; 45.4%), covering the both printed and poster installed on the OR’s wall (13; 16.9%), as well as printed and electronic (13; 16.9%), electronic and poster (3; 3.9%), and printed, electronic and poster (6; 7.8%).

For the implementation of the LVSC in hospitals, most participants (65; 84.4%) answered that there was an educational program, offered exclusively to the nursing team.

With regard to the definition of responsibility for conducting the daily LVSC check in the OR, the circulator nurse was the person who received the highest percentage (59; 76.6%) (Table 1). It should be noted that, in the data collection instrument, respondents could indicate one or more options.

Regarding the initiative to implement the LVSC in hospitals, the participants attributed the highest percentages to nurses, namely: 49 (63.6%) to the SC nurse, 48 (62.3%) to the SC coordinating nurse, and 38 (49.4%) to the nursing manager. Of the 77 nurses, 26 (33.8%) attributed the initiative to the anesthesiologist or head of the anesthesia service, 14 (18.2%) to the administrative director, and 12 (15.6%) to the surgeon or head of the surgery service. In the data collection instrument, nurses could indicate one or more options (data not shown in tables).

With regard to planning, the participants attributed the highest percentages to nurses, in the following distribution: 55 (71.4%) nurse from the SC, 44 (57.1%) coordinator nurse from the SC, and 33 (42.9%) nursing manager. Next, the anesthesiologist or head of the anesthesia service (25; 32.5%), the surgeon or head of the surgery service (12; 15.6%), the administrative director (6; 7.8%), and others professionals (9; 11.7%). In the data collection instrument, respondents could indicate one or more options (data not shown in tables).

Regarding the daily use of the LVSC by the surgical team, for most nurses (52; 67.5%), the surgical team partially adheres to the use of this instrument. And, for most participants (50; 64.9%), there was an increase in adherence to the use of the checklist by the surgical team as from its introduction in the health service (Table 2).

According to the nurses’ opinion (n=44), 31 (70.5%) pointed out that the sign in was the stage to which the surgical team had the greatest adherence, and 16 nurses (36.4%) indicated the sign out as the stage with the least adherence (data not shown in Table 2).

For 64 nurses (83.1%), there was a difference in adherence to the use of the LVSC among the professional categories (Table 2), and the nursing team (48; 75.0%) had greater adherence; for only one participant (1.6%), the anesthesiologist was the category with the highest adherence. Regarding professionals with less adherence to the daily use of the checklist, 35 nurses (54.7%) reported surgeons, and 11 (17.2%), surgeons and anesthesiologists (data not shown in Table 2).

Most participants reported that the LVSC checking occurs verbally (56; 72.7%). However, only 27 (35.1%) stated that the complete surgical team is present, pays attention, and participates in the checking (Table 2).

Most nurses (57; 74.0%) answered that all items of the LVSC were checked in the OR, but 19 (24.7%) indicated the existence of items that were not checked (Table 2).

Regarding the items whose checking was neglected (n=19), four participants (21.0%) pointed out the items

Table 1. Characterization of the surgical safety checklist implementation process in hospitals, according to the nurses’ report.

Variables	Nurses	
	n=77	Percentage (%)
Time of implementation (months)	27.8 (21.4)*	-
Format of the LVSC		
Printed	34	44.2
Electronic	06	7.8
Board fixed in the operating room	02	2.6
Two or more formats	35	45.5
Educational program for the surgical team		
Yes	65	84.4
No	12	15.6
Responsible for the checking		
Surgeon	3	3.9
Coordinator nurse	18	23.4
Anesthetist	11	14.3
Nurse of the surgical center	43	55.8
Circulator nurse	59	76.6
Others	15	19.5

*Mean (SD=standard deviation); LVSC: surgical safety checklist.

belonging to sign in, among which: laterality marking (n=1), investigation on the use of medicines and previous surgeries (n=2), and difficult access to patients' airway (n=1). For five participants (26.3%), the items belonged to time out, namely: estimated length of surgery (n=1), anticipation of additional risk (n=1), all items belonging to time out (n=2), and issues/ concerns with equipment (n=1). Five nurses (26.3%) also reported that the items belonged to sign out: all indicated the surgical count, and one (5.3%) highlighted the items that were duplicated in the LVSC or that did not apply to a particular surgery. Two participants (10.5%) pointed out the items related to two stages of the LVSC, namely: prediction of blood loss (sign in) and surgical count (sign out) (n=1), and questions related to equipment (time out) and surgical count (sign out) (n=1); two nurses (10.5%) did not inform the data.

Table 2. Characterization of adherence to daily use of the surgical safety checklist in hospitals, according to the nurses' report.

Variables	Nurses	
	n=77	Percentage (%)
Adhesion of the surgical team to the use of the LVSC		
Total	21	27.3
Partial	52	67.5
No	04	5.2
Increase in adherence since the implementation of the LVSC		
Yes	50	64.9
No	26	33.8
Did not answer	01	1.3
Difference in adherence between checking steps		
Yes	44	57.1
No	33	42.9
Difference in adherence to the LVSC among professionals		
Yes	64	83.1
No	11	14.3
Did not answer	02	2.6
Verbal checking of the LVSC by the team		
Yes	56	72.7
No	19	24.7
Did not answer	02	2.6
Complete surgical team present, paying attention and participating in the checking		
Yes	27	35.1
No	50	64.9
Existence of items of the LVSC that are not checked		
Yes	19	24.7
No	57	74.0
Did not answer	01	1.3

LVSC: surgical safety checklist.

DISCUSSION

In the present study, the results indicated the predominance of two LVSC formats available for use in the OR, the realization of an educational program for the nursing team, and the circulator nurse as the responsible for checking the instrument in the OR. Also in higher percentages, the results indicated that nurses were responsible for the initiative and planning of the LVSC implementation process. These results were corroborated with research data on how the LVSC implementation process took place in hospitals in Canada.¹⁰

For the effective implementation of the LVSC, the process should be conducted by a multidisciplinary team. The recommendation is including representatives of each function (surgeon, anesthetist, nurse, circulator nurse, and instrumentalist) and people with the following characteristics: respected by peers, enthusiastic, committed and interested in initiatives to improve patient safety and who believe that communication and teamwork can be optimized. For recruitment purposes, surgeons and anesthetists, in particular, must have availability, exercise good influence, and have a positive image with their peers.⁵

In a similar investigation, the use of the printed format of the LVSC (73%) prevailed over the others.⁸ However, there is no evidence on which type of list format best supports the team's performance in checking.^{3,5}

Most nurses indicated that they carry out an educational program, only with the participation of the nursing team, prior to the introduction of the LVSC in the OR, with content centered on explanations of why and how to use the instrument. In addition, 12 nurses indicated that this strategy was not offered. In the literature, education, involving all professional categories, is agreed to be an essential and facilitating element in the implementation of the LVSC.^{3,5,11} Given the diversity of educational strategies used, the involvement of only a few professional categories^{3,11} or the absence of an educational process, education as a facilitator can become a barrier.¹²

To better subsidize this fundamental and irreplaceable element, education is recommended as a more comprehensive process under the triad:

- informal conversation with each member of the surgical team: the dialogue aims to connect each professional with the idea and purpose of the LVSC and, directly, request collaboration for using the instrument before the actual introduction into the OR;

- train each member of the surgical team before its actual use: the approach includes an explanation of how to do, demonstrate and give the surgical team an opportunity to practice checking exhaustively. For the feasibility of this step, team members can be trained individually, in groups, or all together;⁵
- continuous training and on-site guidance, for the introduction of the LVSC in the OR: team members need to be supported and oriented to improve performance in daily use.^{5,11}

With regard to the responsible for conducting the daily LVSC checking in the OR, the highest percentages indicated by participants were the circulator nurse in the room, followed by the SC nurse. In other studies, the results showed that the circulator nurse coordinated the LVSC⁸ checking process or that the responsibility for the checking the instrument was shared among the different professional categories.^{12,13}

Based on the analysis of available evidence, a guide for more assertive implementation and sustainability of the LVSC was developed. In general, the following steps are necessary: the composition of a multidisciplinary team to plan and execute the implementation, with definition of roles, expectations, and processes; an implementation team who must know the historical aspects and objectives related to the checklist; the assessment of the work environment with on-the-spot observation of the teams' performance and the group's dynamics in the context of the OR and culture assessment; decision-making to introduce the LVSC, that is, deciding whether the time is right to introduce the instrument based on the preliminary assessments mentioned; the adaptation and testing of the LVSC, consideration of one of the key tasks of the implementation team, prior to the use of the instrument; the planning, which includes defining what the implementation team will do, how and when, to disseminate the use of the instrument with a list of tasks related to each action and preparation of a schedule. In this phase, individual conversations should be held, the use of the instrument should be promoted, as well as education/training for the team and training, on-site supervision.⁵

Private conversations are considered the first stage of learning for the surgical team. It should be noted that there is no substitution for this conversation with each team member. At this point in the conversation, promoting the LVSC with creative strategies, conveying messages about it, presenting the efforts undertaken and the progress achieved so

far is recommended. The second stage of learning consists of training and disseminating the instrument, with the objective of explaining it and demonstrating how it should be used, and giving the team the opportunity to practice. Monitoring, *feedback*, support, and continued on-site training are considered the third part of the learning process for an effective use of the LVSC and sustainability over time. This step is performed by a *coach*, a team member recruited and previously trained for this function, with a view to improving the team's daily performance. Promoting continuous improvement with periodic reviews can help in the proper use of the checklist and assist teams in adapting to new conditions.⁵

In the present study, in relation to the daily use of the LVSC, the results showed that most nurses responded that the surgical team partially adheres to its use. Adherence is different between the checking stages, with greater adherence at the sign in and lesser at sign out. Among the professional categories, there was greater adherence by the nursing team and lesser by surgeons, and also the existence of LVSC items that are not checked; time out and sign out items were the most neglected.

In a national study, the authors analyzed 375 medical records of surgical patients. The results showed adherence of 60% to the use of the LVSC, but only in 4% the form was completely filled in.⁸ In places in which the rates of adherence to the LVSC are high, the quality of filling and the reliability of the instrument's objectives are often compromised.¹¹

In the present study, most nurses responded that there was an increase in adherence since the beginning of the implementation of the LVSC in the health services surveyed. However, for 33.8% of the participants, there was no increase in adherence by the surgical team. Other studies have shown similar results, because the use of the checklist has not been sustained over time.^{13,14}

As to the difference in adherence between the stages of the LVSC, data in the present study were similar to those identified in a national survey conducted in three hospitals in the Federal District. Adherence to the sign out stage was lower than the first two stages, mainly in relation to the item regarding problems with equipment and surgical counting. In cases in which surgical counting was performed, the procedure occurred after the patient left the OR.⁸

A possible explanation for low adherence to the last stage of the LVSC may be the departure of members of the OR surgical team before the end of the procedure.¹⁵

When an LVSC stage is omitted, without damage to the patient, the improper use is easily incorporated by the team;

in these circumstances, this instrument can be considered a weak security barrier.¹⁶

In the literature, there is evidence to prove the different resistance in the use of the LVSC among the professional categories: supporting the instrument use tends to be greater by nurses and anesthesiologists than by surgeons.^{3,4} Generally, nurses are more used to the use of checklists as a structured component of clinical care, which can favor adherence by this category.¹⁷ In contrast, doctors believe that the formal use of the LVSC is redundant, because they already promulgate safety principles in clinical practice. Therefore, the sustained use of the LVSC can be discipline-specific and successful when doctors are actively engaged in the process.⁴

In this study, most nurses answered that, in the daily checking of the LVSC, the complete surgical team is not present, does not pay attention, and there is no active participation of team members. In view of these inadequacies, the use of the LVSC may have been understood as a mere exercise in pointing out items in these places, and not as a practice that favors the prevention of adverse events, improved communication and teamwork, that is, contradictory understanding to what is advocated by the WHO.

In a study carried out in five hospitals in England with a focus on observing the execution of the LVSC in ORs, the results were similar. In 40% of cases, team members were absent during their time out and sign out, and were unable to interrupt other activities in approximately 70% of cases. The most adequate performance occurred when surgeons conducted the checking: all members were present and interrupted other activities to comply with the items of the LVSC.¹⁵

In the health service, the fact that the LVSC is not performed reliably to the WHO recommendation should not be viewed with dismay, as it reveals the possibility for improving the implementation process.¹⁸ In general, the implementation of behavioral interventions designed to qualify clinical practice is permeated with nuances of success or failure, given that the experience is rarely successful or unsuccessful in its entirety. The implementation of the LVSC may promote the qualification of the work process and teamwork in some contexts, but it fails or has limited success in others. Considering such premises in the implementation of this instrument is essential to list approaches that are more compatible with the institutions' realities.⁴

Checking the LVSC should not be limited to confirming the patient's identity, the operation and the surgical

site, the necessary instruments, fluids, blood products, and available equipment. It must also include the presentation of all team members, and the surgeon must inform about the critical stages of the surgery and resolve any concerns voiced by the anesthesia and nursing teams.¹⁹ The lack of active participation by team members violates the guiding principles of the LVSC, since dialogue can improve surgical care and positively change the way members of the surgical team interact with each other and with patients. Therefore, these items should not be removed or neglected.⁵

In a North American study, conducted in 2018, the authors described the experience of hospitals in implementing the LVSC from 2010 to 2017. From this process, three lessons were presented for hospital policy makers at the local, state, or national level:

- successful program must be planned to involve all stakeholders (doctors, nurses, nursing technicians, instrumentalists, among others);
- a variety of strategies must be offered (educational process that includes face-to-face meetings, online seminars, face-to-face training, and follow-up visits);
- implementation process that proposes changes in the conventional process will need time and resources.²⁰

In the context of safe surgery, participative nursing leadership, with communication between the team and the patient, with family members and with hospital managers, will contribute to promoting patient-centered care, in a continuous and safe way.²¹

Regarding the limitations, caution is recommended in generalizing the results listed, because the study was conducted in two municipalities in Paraná State. Data analysis was based on information reported by nurses working in the SC. Thus, relevant aspects of the LVSC implementation process may have been reported differently according to reality. For example, the reporting of data on adherence and other aspects of the LVSC use may have been more positive than, in fact, it occurs in practice, when the context is observed directly.

CONCLUSION

Regarding the main study conclusions, the LVSC was available in two formats for use in the OR; the educational program was a relevant strategy carried out, but

offered predominantly to the nursing team, and checking the instrument, in most cases, involved only the circulator nurse. Nurses were primarily responsible for the initiative and for planning the implementation process of the checklist in question.

According to most nurses' opinion, adherence to the use of the instrument is partial, with differences between the checking steps, being higher at sign in and lower at sign out. Adherence to daily use of the LVSC is higher by the nursing team and lower by surgeons. And, among the checking stages, items of the time out and sign out were the most neglected.

As to the implications for perioperative nursing, the evidence generated offers subsidies for the knowledge of how the implementation of the LVSC occurred, its daily use and which strategies were adopted in this process in the Brazilian context. Therefore, such evidence contributes to reduce knowledge gaps and promote scientific advancement in this Nursing area. In addition, the knowledge produced helps to implement the instrument in services that do not yet use this practice, as well as to review those who have already adopted it in their daily activities. Therefore, the evidence generated leads to an increase in the quality of care provided and permanent promotion of surgical patient safety.

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