# SAFE SURGERY CHECKLIST APPLICABILITY IN HOSPITAL SURGERY CENTERS

*Aplicabilidade do checklist de cirurgia segura em centros cirúrgicos hospitalares*

*Aplicabilidad de la lista de cirugía segura en centros quirúrgicos de los hospitales*

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**ABSTRACT: Objective:** To identify the safe surgery checklist applicability in hospital surgery centers. **Method:** This is a quantitative research carried out at national level, after approval by the Research Ethics Committee of Universidade Federal de Alagoas. The research was performed using e-mail, and included nurses who were members of Associação Brasileira de Enfermeiros de Centro Cirúrgico, Recuperação Anestésica e Centro de Material e Esterilização (SOBECC) and worked in surgery centers. Data analysis was performed by means of the chi-square test. **Results:** All the participants (100%) were aware of the checklist. Of the 113 research participants who used the checklist, 89 (78.76%) participants observed changes in the surgical team's interpersonal communication, and 94 (83.18%) participants confirmed that after the checklist implementation, there were improvements in professional assistance performance. The main advantages of the checklist implementation were rapid and easy completion and service organization. Team's disengagement was the main difficulty reported by the research subjects. **Conclusion:** The safe surgery checklist application contributes to the quality of care provided to surgical patients.
**Keywords:** Surgery department, hospital. Checklist. Patient safety.

**RESUMO: Objetivo:** Identificar a aplicabilidade do *checklist* de cirurgia segura em centros cirúrgicos hospitalares. **Método:** Pesquisa quantitativa, realizada em nível nacional, após aprovação do Comitê de Ética em Pesquisa da Universidade Federal de Alagoas, via correio eletrônico, com enfermeiros associados à SOBECC e que atuam em Centro Cirúrgico. A análise dos dados foi realizada pelo teste do $\chi^2$. **Resultados:** Todos os participantes (100%) conhecem o *checklist*. Dos 113 participantes da pesquisa que o aplicam, 89 (78,76%) observaram mudanças na comunicação interpessoal da equipe cirúrgica e 94 (83,18%) afirmaram que após a aplicação do *checklist* houve melhorias na atuação profissional na área assistencial. As principais facilidades para a aplicação do *checklist* foram o preenchimento rápido e fácil e a organização do serviço. A falta de participação da equipe foi a principal dificuldade referida pelos sujeitos da pesquisa. **Conclusão:** A aplicação do *checklist* de cirurgia segura contribui para a qualidade da assistência prestada ao paciente cirúrgico.
**Palavras-chave:** Centro cirúrgico hospitalar. Lista de checagem. Segurança do paciente.

**RESUMEN: Objetivo:** Identificar la aplicabilidad de la lista de cirugía segura en centros quirúrgicos de los hospitales. **Método:** Estudio cuantitativo, llevado a cabo a nivel nacional, después de la aprobación del Comité de Ética en Investigación de la Universidad Federal de Alagoas, vía correo electrónico, con las enfermeras asociadas al CSSD (SOBECC) y que trabajan en un centro quirúrgico. El análisis de los datos se realizó mediante el test de $\chi 2$. **Resultados:** Todos los participantes (100%) conoce la lista de comprobación. De los 113 participantes en el estudio que se aplican, 89 (78.76%) observaron cambios en la comunicación interpersonal del equipo quirúrgico y 94 (83.18%) informó de que, tras la aplicación de la lista de comprobación, ha habido mejoras en la práctica profesional en el área asistencial. Las principales facilidades para la aplicación de la lista de comprobación fueron el llenado rápido y sencillo, y la organización del servicio. La falta de participación del equipo fue la principal dificultad reportadas por los sujetos de la investigación. **Conclusión:** la aplicación de la lista de comprobación de cirugía segura contribuye a la calidad de la atención dada a los pacientes quirúrgicos.
**Palabras clave:** Servicio de cirurgía en hospital. Lista de verificación. Seguridad del paciente.

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## INTRODUCTION

Some mistakes made by health professionals have a strong impact on patients' lives. The most common adverse effects are performing surgeries in the wrong patients or laterality mistakes[1].

The strategy adopted by the World Health Organization (WHO) to promote safety of the surgical patient was the creation and implementation of a standard checklist in health institutions to support surgical teams in decreasing the occurrence of damage to patients[2]. This tool encompasses safety measures during the intraoperative period; however, the pre- and postoperative periods are also highly important to the surgical patient's safety[3].

The tool is characterized as a standard checklist that needs to be observed by the entire surgical team, i.e. anesthesiologist, surgeon, assistants, and nursing professionals. It is composed of three stages: the first checking (Sign In) takes place before induction of anesthesia, with the patient's presence in the operating room. The second checking (Time Out) is performed before the surgical incision, and the last checking (Sign Out) is carried out by the end of the procedure, before the patient leaves the operating room to the recovery room[4].

The checklist implementation can be fast and cost-effective. In addition, only one person is recommended to be in charge of the application. Although the nurse is the most indicated professional to coordinate the checking process, any professional participating in the surgical procedure can play this role. If needed, such professional should have the authority to interrupt or impede the surgical process advancement, as small details may be unnoticed[5].

The need to deepen the research on this theme supported this study. Consequently, hospital's teams and health professionals may acquire more knowledge of the importance of safe care processes; therefore, it is relevant for ensuring excellence and quality to the care provided to the surgical patient.

## OBJECTIVE

To identify the safe surgery checklist applicability in hospital Surgery Centers.

## METHODS

This is a quantitative research approved by the Research Ethics Committee of *Universidade Federal de Alagoas*, CAAE: 42024315.9.0000.5013. The study included professors and nurses from five Brazilian regions. These professionals worked in surgery service management and assistance, and their e-mails were provided by the *Sociedade Brasileira de Enfermeiros de Centro Cirúrgico, Recuperação Anestésica e Centro de Material e Esterilização* (SOBECC). The inclusion criteria adopted to build the sample of this study were working as a nurse in surgery centers. The exclusion criteria were working in the Central Sterile Supply Department (CSSD) and Post-anesthesia Care Unit (PACU) and not being a SOBECC member.

Data was collected from September to November 2015. We maintained all data as private and confidential. The invitation to participate in the research was sent via e-mail, including guidelines and rationale of this study, as well as the Free Informed Consent and the questionnaire.

The data collection tool applied in this research was an adaptation of the questionnaire used in the study *"Checklist de cirurgia segura: análise da segurança e comunicação das equipes de um hospital escola,"* which was carried out in the countryside of the state of São Paulo[5].

The data collected were organized in tables, and then analyzed in statistical software used in research (Statistical Package for the Social Sciences – SPSS). Data analysis was carried out by means of the chi-square test. If the p-value was less than 0.05, results were considered statistically significant.

## RESULTS

The study participants were 147 nurses who worked in all the regions of Brazil. The Southeast region of Brazil had the highest representativeness in the sample with 67 participants (45.57%), followed by the South region with 36 (24.48%) participants (Table 1). The importance of including all the Brazilian regions in this study should be highlighted, as it enabled to verify the checklist applicability at a national level.

The age range with higher prevalence among the research participants was 30–39 years. This age range included 60 (40.82%) participants, and was followed by the age range of 40–49 years, with 39 (26.53%) participants. Participants older than 50 years corresponded to 29 (19.73%) respondents, and 19 participants were aged 22 and 29 years (12.92%). The sex distribution was different: 132 participants (89.80%) were female and 15 participants (10.20%) were male.

Table 2 shows the predominance of specialization in the educational level of the subjects – 78 (53.06%) participants. Nurses with a master's degree totaled 37 participants (25.18%).

The analysis of length of professional experience in surgery centers showed that 37 participants (25.17%) had professional experience equal or higher than 16 years; 31 participants (21.08%) had 6–10 years of experience; 27 professionals (18.37%) had 3–5 years or 11–15 years; and 25 professionals had 0–2 years (17.00%) of professional experience in surgery centers.

Of the 147 participants, 138 (93.87%) of them worked in assistance or management of surgery centers, 8 (5.44%) were nursing professors in the studied field, and only 1 (0.68%) was a nursing resident.

Among the 147 participants, 100.00% are aware of the safe surgery checklist; 113 (76.87%) declared that the safe surgery checklist is applied in the surgery center where they work; and 34 (23.12%) do not use it. The 34 (23.12%) subjects that do not use the checklist reported that they would like it to be applied if they had been working as nurses in an operating room.

**Table 1.** Geographic distribution of the research subjects (Maceió, Alagoas, Brazil, 2015).

| Variable | n | % |
|---|---|---|
| Geographic distribution of participants | | |
| North region | 8 | 5.44 |
| Northeast region | 25 | 17.00 |
| South region | 36 | 24.49 |
| Southeast region | 67 | 45.58 |
| Central West region | 11 | 7.49 |
| Total | 147 | 100.00 |

n: number of participants; %: frequency.

**Table 2.** Distribution of the educational level of the participants (Maceió, Alagoas, Brazil, 2015).

| Variable | n | % |
|---|---|---|
| Educational level | | |
| Undergraduate | 13 | 8.84 |
| Graduate | 78 | 53.06 |
| Master's Degree | 37 | 25.18 |
| Doctor's Degree | 18 | 12.24 |
| Post-doctor's Degree | 01 | 0.68 |
| Total | 147 | 100.00 |

n: number of participants; %: frequency.

There was a predominance of checklist use in private health services – 47 (41.59%) participants. However, the discrepancy in relation to the public system, that is, 42 (37.16%) subjects who used the checklist, were not strong. Research subjects who work both in the public and private systems represent 24 (21.23%) of the participants.

Of the 113 participants who used the checklist in the surgery center where they work, 89 (78.76%) declared that such use caused changes in the surgical team's interpersonal communication, and 24 (21.24%) did not observe these changes. There was a statistically significant difference (p=0.013) in the association of interpersonal communication changes with hospitals public or private systems, considering that among the 47 participants working in the private system, 42 (89.4%) observed changes in communication, whereas only 5 (10.6%) did not observe these changes (Table 3). Changes in the surgical team interpersonal communication after the checklist implementation were more frequently observed by participants who worked in private health services.

When the participants listed the difficulties and advantages of using the safe surgery checklist, they mentioned more than one reason. Among the 113 subjects who applied the checklist in the surgery center, 59 (52.21%) mentioned easy and rapid completion and 44 (38.94%) mentioned service organization. These were the most referred advantages, followed by low cost — 42 (37.17%) — and care agility — 22 (19.46%).

The health institution system (public or private) also showed statistical difference associated with care agility (p=0.006) (Table 4). Of the 113 participants who used the checklist, 91 (80.53%) did not refer care agility as an advantage. Of these 91 subjects, 42 (46.15%) worked in the private system, whereas 35 (38.47%) worked in the public system.

**Table 3.** Changes in the surgical team's interpersonal communication after checklist implementation (Maceió, Alagoas, Brazil, 2015).

| Variable | Yes | | No | | p-value |
|---|---|---|---|---|---|
| | n | % | n | % | |
| Type of health institution | | | | | |
| Public | 27 | 64.3 | 15 | 35.7 | 0.013 |
| Private | 42 | 89.4 | 5 | 10.6 | |
| Both | 20 | 83.3 | 4 | 16.7 | |

n: number of participants; %: frequency; p<0.05: statistically significant difference.

There was a statistically significant difference (p=0.003) for rapid and easy completion, according to public or private hospital systems. Of the 113 participants who used the checklist in the surgery center where they work, 54 (47.79%) declared that its completion was rapid and easy. Among them, 30 (55.55%) worked in public health institutions.

The reasons proposed as difficulties in using the checklist were team's disengagement, difficult comprehension of some items, lack of checklist guidelines, long completion, and no difficulties in applying the checklist, among others. Team's disengagement was referred as the main difficulty by 88 (77.88%) of the 113 participants who used the checklist in the Surgery Center (SC) where they work.

Table 5 shows a statistically significant difference (p=0.016) related to the perception of improvements in the nurse's performance after the checklist implementation, according to the participant's educational level. Among the participants, 94 of them (83.19%) declared that there were improvements in the performance of the health care team and 19 (16.81%) of them declared no improvements. Of these 94 participants, the higher frequency of those who reported improvements in the nursing care were among professionals with graduation degree — 46 (48.93%) — and master's degree — 25 (26.60%).

Of the total amount of participants, 91 (80.53%) stated that the checklist did not contribute to agility in the surgical patient's care. For subjects with professional experience greater than six years, the comprehension of the checklist items was not a difficulty, as only 7 (6.20%) of the 113 participants mentioned such difficulty. The regions where the checklist was most applied were the Southeast and South, represented by 55 (48.68%) and 27 (23.90%) respondents, respectively.

**Table 4.** Assistance agility as an advantage of the checklist implementation in public and/or private systems (Maceió, Alagoas, Brazil, 2015).

| Variable | Yes | | No | | p-value |
|---|---|---|---|---|---|
| | n | % | n | % | |
| Type of health institution | | | | | |
| Public | 7 | 16.7 | 35 | 83.3 | 0.006 |
| Private | 5 | 10.6 | 42 | 89.4 | |
| Both | 10 | 41.7 | 14 | 58.3 | |

n: number of participants; %: frequency; p<0.05: statistically significant difference.

**Table 5.** Improvements in nurse's assistance performance in surgery center after checklist implementation, according to the professional educational level of the research subjects (Maceió, Alagoas, Brazil, 2015).

| Variable | Yes | | No | | p-value |
|---|---|---|---|---|---|
| | n | % | n | % | |
| Educational level | | | | | |
| Undergraduate | 10 | 100 | 0 | 0.0 | 0.016 |
| Graduate | 46 | 75.4 | 15 | 7.4 | |
| Master's Degree | 25 | 92.6 | 2 | 7.1 | |
| Doctor's Degree | 13 | 92.9 | 1 | 100.0 | |
| Post-doctor's Degree | 0 | 0.0 | 1 | 100.0 | |

n: number of participants; %: frequency; p<0.05: statistically significant difference.

## DISCUSSION

In the majority of Brazilian public hospitals, professionals are subject to work overload, low salaries, inappropriate working conditions, and absence of safety protocols. These characteristics certainly increase the probability of mistakes[6].

The optimization of safety of the surgical patient should be implemented in all health institutions, whether they are public or private, by means of trainings and lectures about its importance for patients and health professionals. The safer the surgical procedure, the better the quality of care, safety, and recovery both for the patient and the multidisciplinary team. However, many team members working in public and private hospitals show resistance to the checklist implementation, relying on their memories, without taking into account the fatigue resulting from long working hours[6].

Checklist use is also necessary as a means of improving interpersonal communication, that is, as a facilitator to patient's care. The checklist contributes to minimize conflicts caused by unexpected situations, and the team members' contributions before the surgical procedure improves surgical patient's safety[5]. By means of the checklist, communication among team members occurs, and the team also confirms items and reports their action and concerns to all professionals in the operating room.

When health team communication is not effective, events such as suspension of surgeries, procedures, and exams become very common. Furthermore, patients may undergo long periods without food and they may not receive a proper diet owing to these failures, which generate delays and failures in patient's health care[1].

Many errors caused by failures in the communication process may be irreversible. Communication processes are very complex and dynamic in health services. High flow of

information, large number of professionals from different health teams, and high demand of activities, lead to necessary updates and information exchange with patients, family, and teams. The lack of integrated communication processes between the different health teams and services is a factor that contributes to failures in the care process[1].

In this context, it is worth mentioning that the surgical team is composed of surgeons, anesthesiologists, nursing team, technicians, and other professionals of the operating room involved in the surgery. The team is the most critical resource for the surgical procedure success. Thus, if a team effectively works together to use their knowledge and abilities in favor of the surgical patient, a considerable proportion of life-threatening complications can be avoided[1]. More than only completing the checklist, professionals involved in the anesthesia and surgical procedures should rescue the origins of their humanistic and ethic development[7].

The main difficulty reported in this study concerning the checklist use was the disengagement of the surgical team, which proves that this tool is properly used when professionals understand its importance; therefore, the participation of all team members is necessary[8]. Educative actions directed to paradigm shift, such as surgeon's hierarchy, are a strategy to avoid problems associated with the checklist use and lack of surgical team's commitment[9]. Efforts from managers and professionals should aim at awareness and full knowledge of the importance and correct use of the safe surgery checklist to ensure the safety of patient and surgical team[10].

Therefore, in order to properly implement the "Safe Surgery Saves Lives" program from WHO in a health organization that provides surgical assistance, much more should be done than only implementing a checklist of the flow and stages of the anesthesia and surgical procedure. To promote a change in the patient's safety culture is imperative to enable all professionals of the surgical team and organization management to understand the need and the advantages of this protocol for all those people involved[11].

Rapid and easy completion of the checklist was the characteristic most frequently reported by the study participants. It is estimated that the three phases of the checklist take three minutes to complete, and it is recommended that only one person guide its implementation[5].

Nurses are the most indicated professionals to guide the checklist implementation; however, any professional who participates in the surgical procedure can play this role. On the basis of the presented results, it can be assumed that the nurse became more participative and active in the operating room.

The checklist intends to provide an efficient and simple set of priority verifications to promote effective work processes and communication among the team members. The checklist purpose is not to pronounce something that was memorized or to prevent the workflow. Thus, to properly implement the checklist in the operating room and for the teams to learn how to use it effectively, it is necessary to put the checklist into practice[4].

Verifying the checklist applicability in many regions of the country, in public and private hospitals, collaborates to understanding the challenges of the implementation process. The importance of an organizational culture change involving health managers and professionals should be highlighted. By means of this change, teams can comprehend the patient's safety as essential to prevent adverse effects.

This study had important limitations involving the population and sample, because data collection was conducted via e-mail. Results are limited to the investigated sample of nurses who are SOBECC members; therefore, they do not enable generalizations to the general population of nurses working in Surgery Centers in the country.

## CONCLUSION

All the research participants are aware of the safe surgery checklist, which is more frequently used in the Southeast and South regions and in private health services.

The checklist implementation led to some changes in the surgical team's interpersonal communication and to improvements in the nurse's assistance work.

The advantages found regarding the checklist use were easy and rapid completion, service organization, and assistance agility. Team's disengagement was the main difficulty found in the checklist use, followed by difficult comprehension of some items, long completion, and absence of checklist guidelines.

Although all participants of this study were aware of the checklist, they did not know how to use it correctly. Training sessions with professionals who work in the operating room are essential to raise awareness of the importance and correct use of this instrument.

Thus, it is necessary to improve teamwork, considering that the safe surgery checklist use aims at promoting the surgical patient's safety, thus providing a safe environment and efficient interpersonal communication among the surgical team members.

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