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ORIGINAL ARTICLE

NURSES' KNOWLEDGE OF SURGICAL SITE INFECTION PREVENTION AND SURGICAL SAFETY CHECKLIST[1]

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ABSTRACT

Objective: to assess surgical center nurses' knowledge regarding surgical site infection prevention measures during the perioperative period and the surgical safety checklist. **Method:** a cross-sectional study was conducted with 30 nurses working in surgical centers of 30 large hospitals in Minas Gerais, Brazil, between February 2018 and April 2019. **Results:** regarding perioperative measures, 60% of nurses reported performing trichotomy in surgical centers, with 36.7% using blades; 60.9% indicated adequate surgical hand preparation for surgeons; 10% were unaware of procedures for preparing patients' skin; and 70% did not implement the practice of warming patients. Concerning the checklist, 93.3% stated they were familiar with it, but the team introduction was only performed by 53.3%. The time-out procedure was executed by 86.7%, while surveillance criteria for surgical site infection were unknown to 93.3%. **Conclusion:** limitations were identified in nurses' knowledge of measures during the intraoperative period, especially regarding trichotomy, preparation of patients' and surgeons' skin, and patient warming. In the checklist stages and items, gaps were observed in team introduction and time-out procedure execution, as well as in the criteria for diagnosing surgical site infection.

Keywords: Knowledge. Surgicenters. Surgical Site Infection. Safe Surgery. Perioperative Nursing.

INTRODUCTION

A surgical site infection (SSI) is one of the most significant health care-associated infections (HAIs). SSIs represent a global public health problem due to their high morbidity and mortality rates, as well as their impact on hospital stays and increased costs resulting from their treatment[1-3].

SSI is defined as that which occurs at the surgical incision site and can be classified as superficial, deep, or as that which involves organs and cavities that were opened or handled during surgery[1,2].As it is multifactorial in occurrence and influenced by factors relating to patients, the procedure and the surgical team[1], care must be taken throughout the perioperative period to reduce the risk of SSIs. National and international guidelines have been published aiming to recommend measures for SSI prevention and to provide safer and higher quality care to patients[1,4-7].

The intraoperative period is recognized as one of the most important periods for preventing SSIs. Therefore, practices carried out in a surgical center (SC) during a surgical procedure must be extremely rigorous. These practices include controlling the air, verifying material sterility, team attire, surgical antisepsis, controlling the number of people in the SC, keeping doors closed, surgery time, and aseptic technique, among others[4,6,7]. On the other hand, the complexity of the procedures, the importance of communication among professionals, and the dynamics of the work process in that location can also influence inadequate adherence to these measures[8].

Due to the possibility of error, surgical safety checklists have been used to reduce mortality, reoperation, costs, and infectious outcomes, including SSIs[9,10]. These checklists increase patient safety by reducing errors resulting from surgery and ensuring practices that prevent SSIs. These practices include properly preparing patients' skin, administering prophylactic antibiotic therapy, sterilizing materials and instruments, monitoring patients' temperature and blood glucose levels, and correctly using personal protective equipment

[1]Derived from the dissertation titled Safe Surgery Saves Lives Program as a Global Challenge of the World Health Organization: overview of surgical site infection prevention measures adopted in large hospitals in Minas Gerais, presented to the Graduate Program in Nursing at the Federal University of Minas Gerais, 2019.

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and surgical team attire[10].

However, a safe surgical procedure clearly depends on the multidisciplinary team's knowledge of preventive measures. SC nurses play a fundamental role in training, implementing, motivating, and monitoring professionals' adherence to institutional protocols. Through analyzing indicators and making rational use of resources, which must be known by nurses in order to propose actions to the nursing and multidisciplinary team[9], it is possible to promote collective well-being.

Although the use of a surgical safety checklist and SSI prevention actions during the perioperative period are well-described in the literature[1], studies indicate that healthcare professionals' knowledge is often lacking[11].This failure can be justified by the low adherence observed regarding the use of surgical safety checklists[10], which may interfere with the non-applicability of such measures in practice, impacting patient safety[2].

Given the above, the following question arises: what is the level of knowledge of SC nurses regarding SSI prevention measures and the adoption of a safe surgery checklist? Understanding this knowledge is fundamental since these professionals are responsible for managing and promoting adherence to these practices in these sectors. They also actively participate in discussions at different levels of the service. Furthermore, they are responsible for monitoring indicators related to SSIs in conjunction with the Hospital Infection Control Service (HICS). This process can help identify strategies to mitigate the risk of SSIs and adverse events associated with surgical procedures.

In this context, this study aimed to assessSC nurses'knowledge regarding SSI prevention measures during surgery and a surgical safety checklist in large hospitals in Minas Gerais, Brazil.

METHODS

This is a cross-sectional study conducted at 30 large hospitals in the state of Minas Gerais, Brazil, between February 2018 and April 2019. The studyispartofamainprojectcalled"*Panorama dos Desafios Globais da Organização Mundial de Saúde para Segurança do Paciente em Hospitais de Grande Porte de Minas Gerais*".

Study participants were selected from the Brazilian National Registry of Health Establishments, which identified 542 hospital institutions, including general hospitals, in Minas Gerais. Of those, 32 were classified as large hospitals because they had between 150 and 299 beds at the time of data collection. Large hospitals in Minas Gerais that met the inclusion criteria were accepted. These hospitals were considered public, private, philanthropic, and/or teaching hospitals that provided medium to high complexity care. Small hospitals and those with a conflict of interest with the research team were excluded.

The institutions were invited through telephone contact and/or a formal letter sent to hospital managers. At this time, the objectives, relevance, and potential contributions of the research were presented. The voluntary, non-remunerated nature of participation was emphasized, as well as the guarantee of confidentiality and secrecy regarding the identity of the institutions involved and the resulting benefits. After the institutions accepted, individual interviews were scheduled with the coordinating nurses of the SCs according to their availability. Nurses signed the Informed Consent Form (ICF).

The coordinating nurses were interviewed using a structured instrument to assess their knowledge of SSI prevention and surveillance measures, as well as the safe surgery checklist stages.

The instrument was developed based on the best practices for SSI prevention contained in the manuals and guidelines of national and international organizations and associations such as the World Health Organization (WHO), the Centers for Disease Control and Prevention, the National Institute for Health and Clinical Excellence, the Association for Professionals in Infection Control and Prevention, the Association of periOperative Registered Nurses, and the Brazilian National Health Regulatory Agency. It is important to note that the researcher received training in questionnaire application techniques before collecting data.

The questionnaire items designed to assess the coordinating nurse's knowledge of SSI

prevention in SCs included surveillance of SSIs, antibiotic prophylaxis, trichotomy, surgical hand preparation, patient skin preparation, and team attire. The surgical safety checklist addressed items such as introducing the surgical team, performing the time-out procedure, verifying sterilized materials and instruments, monitoring patients' body temperature and blood glucose levels, and checking materials at the end of the procedure.

After conducting pre-tests to validate the questionnaire, a descriptive data analysis was performed, followed by a readjustment of the instrument's questions. The consistency of the instrument was assessed using Cronbach's alpha, which resulted in a value of 0.647, indicating good internal consistency.

Research data were tabulated using the Statistical Package for the Social Sciences version 22.0, and a descriptive statistical analysis was performed.

The project was approved by the *Universidade Federal de Minas Gerais* Research Ethics Committee, under Opinion 2,054,308. It complies with the principles of Resolution 466/2012 of the Brazilian National Health Council for research involving human beings. The project received financial support from the Minas Gerais Research Support Foundation.

RESULTS

Of the 32 hospitals in the state of Minas Gerais that met the inclusion criteria, 30 comprised the final sample. Thus, 30 coordinating nurses of SCs were interviewed, one from each institution.

At the time of the research, the SCs of the participating hospitals had an average of nine (4-19) and performed an average of 721 (250-1,300) surgeries per month and 8,872 surgeries per year(1,400-16,280).

The hospitals served the following clinics: general surgery (96.7%; 29); orthopedic surgery (93.3%; 28); gynecological surgery (83.3%; 25); and plastic surgery (80%; 24). Only 26.7% (eight) performed transplants; 36.7% (11) performed head and neck surgeries; and 43.4% (13) performed pediatric surgeries.

After administering the questionnaire to the SC coordinating nurses at each hospital, it was found that 93.3% (28) of the institutions had a surgical antibiotic prophylaxis protocol to guide prescribers. However, nurses demonstrated a low level of knowledge. Statistically, 26.7% (8) were unaware of this routine.

A prophylactic antibiotic protocol to guide prescription was reported by 93.3% (28) of coordinators. Prescription was guided by a surgeon in 53.3% (16) of services, by an anesthesiologist in 16.6% (5), or by both professionals in 26.6% (8). The choice of antibiotic was related to the type of surgery in 90.9% (20) of cases. However, 26.7% (8) of nurses were unaware of this routine.

With respect to nurses' knowledge of prophylactic antibiotic administration timing, 44% (11) said it occurred 30 minutes before surgery, 40% (10) said it occurred one hour before the procedure, and 16% (4) said it occurred at other times. However, 16.7% (5) of respondents were unaware of this information.

As for preoperative trichotomy, 60% (18) of nurses said this procedure occurs in a SC; 33.3% (10) said it occurs in the inpatient unit; and 6.7% (2) said it occurs in other locations. Regarding the supplies used for this procedure, 36.7% (11) of nurses said they use a cutting blade; 60% (18) said they use an electric hair clipper; and 3.3% (1) said they use depilatory cream.

Concerning surgical hand preparation, 46.6% (14) of nurses reported that it took between three and five minutes. Notably, 23.3% (7) of participants were unaware of this recommendation. The most frequently mentioned solution for this procedure was 60%chlorhexidine degerming solution (18), followed by 10% povidone-iodine (PVPI) degerming solution (6). It is worth highlighting that 20% (6) of those interviewed stated that they used both chlorhexidine and PVPI.

One hundred percent (30) of nurses reported that the surgical team rigorously and correctly donned surgical gowns/aprons. Additionally, 40% (12) mentioned shoe covers as shoe protectors in their hospitals. Only 56.7% (17) of nurses responded that shoes were for the exclusive use of SC staff and that they all had a place to store them.

In relation to preparation and antisepsis of patients' skin, 46.7% (14) of respondents said this practice occurs after anesthetic induction. Meanwhile, 33.3% (10) said it occurs after a

surgeon puts on their gown, and 20% (6) said it happens before the surgeon puts on their gown. The most cited antiseptic for this purpose was PVPI degerming (23.2%, 7), followed by chlorhexidine degerming (16.7%, 5), chlorhexidine degerming alone (10%, 3), chlorhexidine alcoholic (6.7%, 2), PVPI degerming and alcoholic (3.3%, 1), and only PVPI alcoholic (3.3%, 1). It was noteworthy that 36.7% (11) responded that they use both PVPI and chlorhexidine.

Concerning the area where patient skin preparation is performed, 66.7% (18) of nurses responded that it occurs at the incision site and in the surrounding area. Meanwhile, 33.3% (9) reported performing the procedure only at the incision site, and 10% (3) were unaware.

Safe surgery checklist stages and items

With respect to the Safe Surgery Program, 93.3% (28) of nurses indicated that they were familiar with it, 6.7% (2) reported being unaware of the program, and 27.6% (8) did not consider the objective of such a program to be the guarantee of safety for patients and surgical teams.

In regard to the adoption of a safe surgery checklist, 93.3% (28) of respondents said they follow the recommendations. In 89.3% (25) of hospitals, a professional is responsible for applying the checklist. This responsibility falls to nursing technicians (96%, 24) or nurses (4%, 1).

Moreover, 86.7% (26) of nurses responded that the practice of assessing critical surgical stages, potential blood loss, and procedure duration before surgery, during time-out, was carried out using a checklist (38.5%, 10), team discussion (50%, 13), or other methods (11.5%, 3).

All interviewees reported verifying sterilized materials (using process indicators in the SC) and supplies necessary for surgery (such as prostheses) and their expiration dates before the start of the procedure. They also reported signing the ICF before a patient entered the SC.

Hence, 53.3% (16) of nurses were aware of the recommendation to introduce the surgical team by name and function before starting the procedure. However, all nurses responded that identifying the patient and the procedure to be performed before the start of surgery and anesthesia was a known measure.

All interviewees were aware of the recommendation to monitor patients' blood glucose levels when necessary. However, 10% (3) said they did not know when this monitoring should be carried out.

In terms of patient warming, 70% (21) of nurses reported using supplies to maintain patients' normothermia during surgery.

With regard to the awareness of the quantity of surgical instruments, compresses, and needles following the procedure prior to patients' departure from SCs, the findings revealed that 96.7% (29) of respondents reported this information.

All professionals were aware of the timing of identifying the surgical specimen to be sent for anatomopathological analysis. However, 97.7% (29) said it occurred before patients left the SC, while 3.3% (1) said it occurred after patients left.

All nurses revealed that they were aware of the recommendation for the surgical team to record equipment problems before patients leave the SC. However, only 76.7% (23) said they knew about the discussion during the review phase before the patient left the room. This discussion is essential for patients' recovery.

Surgical site infection surveillance

Although 93.3% (28) of nurses reported knowing that patients undergoing surgical procedures should be monitored for SSI occurrence during the postoperative period and after hospital discharge, 6.6% (2) still showed a lack of knowledge regarding this information.

In relation to the sector responsible for monitoring, 83.3% (25 respondents) answered that it is the responsibility of HICS. Meanwhile, 10% (3) were unaware of this process.

As for the time period during which patients should be monitored for SSIs, 16.7% (5) of nurses reported that it should occur during the hospital stay; 20% (6) reported that it should occur after discharge; and 33.3% (10) reported that it should occur during both periods. Notably, 30% (9) were unaware of this situation.

According to SC nurses, the methods of SSI surveillance include an active search of medical records (26.7%, 8), surveillance based on clues

(3.3%, 1), an active search and surveillance based on clues (10%, 3), a telephone call (23.3%, 7), and other methods (3.3%, 1). Notably, 33.3% (10) were unaware of the surveillance method.

With respect to the criteria for diagnosing SSIs, 93.3% (28) of those interviewed were unaware of these criteria. This shows that, while they knew of the existence of a surveillance system for infections, they were unaware of how to conduct it.

A lack of knowledge about the disclosure of SSI rates to surgeons was found among 3.3% (1) of nurses.

DISCUSSION

The present study revealed that nurses' knowledge of SSI prevention and control measures, including preoperative hair removal, skin preparation for both patients and surgeons, and normothermia, was insufficient. Their knowledge of time-out procedures and SSI surveillance in the surgical safety checklist was also inadequate, as noted by other authors[11-13].

Although not entirely satisfactory, these results are supported by numerous national and international studies on nurses' lack of knowledge regarding SSI prevention practices and the adoption of a surgical safety checklist. These results underscore the importance of institutional efforts aimed at this group, as their knowledge directly impacts improved practices. If this professional's knowledge as a team leader is deficient, it will directly impact the recognition of risks to which surgical patients are exposed during the care process. This will lead to inadequate planning of preventive actions. These actions should be adopted within the nursing team and, more importantly, in a multidisciplinary context.

SSIs are a global concern due to their high frequency and economic, psychological, and physical repercussions for both patients and healthcare services. To mitigate their occurrence, it is necessary to adopt best practices aimed at implementing a culture of safety within the institution[4-7].

SC nurses'knowledge regarding evidence-based recommendations described in key national and international guidelines has not significantly changed over the years with respect to this topic, as shown by the results of this study. However, several authors consider these guidelines to be cornerstones for preventing adverse events, making them mandatory for planning and providing high-quality nursing care[11-13].

The processes and practices involved in performing surgical procedures can certainly endanger patients' lives. In this sense, nurses' knowledge and practice focused on preventing SSIs can bridge the gap in the adoption of preventive measures in the daily routine of SCs by the multidisciplinary team. Nurses exercise leadership within the nursing team and act as intermediaries with the surgical team, anesthesiologists, and other professionals working in the SC[11-13].

ConcerningSC nurses'knowledge about SSI prevention measures during surgery, it is noteworthy that despite the documented existence of a prophylactic antibiotic protocol intended to guide its prescription, the correct timing of antimicrobial administration was known by only 84% of the subjects interviewed. One of the measures included in the set of actions for SSI prevention is the use of prophylactic antibiotics. Their targeted use during the perioperative period can reduce the risk of SSI by up to 50% because they reduce the bacterial load in the surgical wound[4,14,15].

In this regard, recognized protocols recommend administering prophylactic antibiotics 30 to 60 minutes before the surgical incision is made. Within this time frame, the serum tissue level will be adequate, allowing for bacterial death in the surgical wound[4,14,15].However, research[16,17] shows that this recommendation has not been adopted in clinical practice by surgical teams, which may be justified by the lack of knowledge of nurses, as identified in the present study.

Prophylactic antibiotic administration is not directly the responsibility of SC nurses, but they are responsible for forecasting and providing the necessary resources and supplies for the unit. They should also encourage the surgical team to adopt this practice. Therefore, it is of the utmost importance that they are familiar with the protocols for the rational use of antimicrobials in order to minimize microbial resistance[14]. Furthermore, these nurses are responsible for

monitoring whether the dose was administered via the correct route and at the correct time, considering their role as managers in the processes involving the surgical team and patients[9].

Trichotomy (hair removal) was predominantly performed in the SC (60%), and 36.7% of the time, it was done with a cutting blade. This finding is noteworthy considering the numerous scientific studies that relate the timing, location, and method of execution of this procedure to a statistically significant increased risk of SSI. [4,6,7,12].

Nurses had a significant knowledge gap regarding surgical hand preparation. When performed at the correct time and with the correct technique, surgical hand antisepsis reduces the bacterial count on the hands of healthcare professionals and decreases microbial recolonization. It is recognized as a fundamental stage in SSI prevention[4,7]. Nursing professionals must ensure that surgeons prepare their hands.

In the context of SSI prevention, strategies and programs have been presented nationally and internationally. From this perspective, the WHO proposed the Safe Surgery Saves Lives Programme[4].Although 93.3% of nurses stated they were aware of the program, which uses the surgical safety checklist as its main verification strategy, the program is primarily implemented by a circulating nurse, or nursing technician, in the SC.

Nursing technicians are part of a multidisciplinary team that requires effective communication among its members to improve patient care. Failures in communication within this team create a discrepancy with the checklist recommendations, which primarily aims to improve communication among professionals. The key lies in the participation of all professionals in the SC at all stages of the procedure. This reflects the idea that everyone should be involved in the surgical procedure to prevent errors caused by communication failures[18,19].

It is essential that all professionals be involved in preserving patient safety because this enables the implementation of the barrier system[7]. However, this study observed the need for the surgical team to be recognized by name and function before starting the procedure, a practice reported to be known by only 53.3% of nurses.

Communication among the team is one of the goals of the safe surgery checklist[4,20,21].However, as observed in the data from this research and in studies in the literature[22,23], communication failures are still recurrent, especially in the identification of patients and the procedure to be performed.

In this sense, it is important to emphasize that having a completed checklist does not guarantee achievement of its primary goal, as it is often applied in isolation by a single professional or team. Even if it is documented and fully applied, it is only carried out by the nursing team in isolation, thus distancing it from its real objective of being a joint effort to reduce complications and improve care for surgical patients[21,24,25].

Ninety-four percent of nurses reported being familiar with patient surveillance for the early identification of SSIs. However, the HICS was attributed responsibility for this action. Since this procedure monitors adverse events and SSIs are one of the main adverse events related to surgical patient safety, this surveillance is expected to be understood as the responsibility of all team members, including nurses[26-28].

Adverse event surveillance should not be limited to the HICS. Above all, it must involve frontline healthcare professionals who need to participate effectively and understand the prevalence and incidence rates of SSIs. Along with the HICS, these professionals should develop evidence-based action plans and strategies to address the service's shortcomings[29]. However, if a group leader—in this case, a nurse—is unaware of the criteria for identifying a SSI, it may compromise the perception of the risk to which the patient is exposed during the care process. This has a negative impact on the measures that should be implemented collectively and in a multidisciplinary manner, especially since SSIs are multifactorial[4,10,30].

Based on the results of this research, the knowledge of nurse leaders regarding SSI prevention and the stages of the safe surgery checklist was assessed as insufficient. Therefore,

efforts should be made to improve their knowledge. To this end, it is suggested that periodic educational programs be implemented to promote continuous improvement and changes in practice regarding SSI prevention. Only then will it be possible to implement best practices and provide surgical patients with safe, high-quality care, preventing SSIs and reducing adverse surgical events[11-13].

This study was limited by its small sample size. Only one member of the multidisciplinary team working in the perioperative period was included, even though such processes involve other sectors of healthcare services. Furthermore, although the data were collected in 2019, the findings of this study align with recent publications on this topic, especially those from the post-pandemic period.

CONCLUSION

Nurses' knowledge of SSI prevention and surveillance measures, as well as the stages and components of the safe surgery checklist, was inadequate.

The most prominent topics were prophylactic antibiotic administration (choice, duration, and timing), preoperative hair removal (location and materials used), surgical preparation of patients' hands and skin, and perioperative hypothermia prevention.

Concerningthe stages and items that make up the safe surgery checklist, the lack of complete conformity regarding knowledge of the Safe Surgery Program, adoption of the checklist, and the complete lack of understanding of the checklist's stages and items was noteworthy. These included: introducing the surgical team by name and function of all its members before starting the procedure; checking surgical instruments, compresses, and needles after the surgical procedure, before the patient leaves the SC; discussing essential concerns for patient recovery during the review phase before leaving the operating room; and situations in which glycemic control should be performed. These gaps in knowledge highlighted significant gaps that can directly interfere with clinical practice when adopting the checklist.

As for surgical patient surveillance for SSIs, it was noteworthy that, even though almost all nurses were aware of the process, they did not recognize and/or name the person responsible for follow-up. Additionally, they lacked knowledge of the surveillance method and the institution's SSI diagnosis criteria.

Due to the inadequate knowledge of SC nurses regarding aspects critical to SSI prevention during surgery, it can be inferred that this knowledge gap may indirectly reflect a safety culture with limited investment in educational programs for professionals in leadership positions who influence the multidisciplinary team'sbehaviors and attitudes. Therefore, further studies are suggested that associate best practices in surgical patient care and institutional safety policies with the active engagement of senior leadership, managers, and the healthcare team.

CONHECIMENTO DE ENFERMEIROS SOBRE PREVENÇÃO DE INFECÇÃO DO SÍTIO CIRÚRGICO E CHECKLIST DE CIRURGIAS SEGURAS

RESUMO

Objetivo: avaliar o conhecimento de enfermeiros do centro cirúrgico acerca das medidas de prevenção de infecção de sítio cirúrgico durante o transoperatório e sobre o *checklist* de cirurgia segura. **Método:** estudo transversal, realizado com 30 enfermeiros atuantes em centros cirúrgicos de 30 hospitais de grande porte de Minas Gerais, entre fevereiro de 2018 e abril de 2019. **Resultados:** em relação às medidas transoperatórias, 60% dos enfermeiros relataram realizar a tricotomia na sala cirúrgica, sendo que36,7% utilizaram lâminas; 60,9% indicaram o preparo cirúrgico adequado das mãos do cirurgião; 10% desconheciam os procedimentos para preparo da pele do paciente;e 70% não implementaram a prática de aquecimento do paciente. Em relação ao *checklist*, 93,3% declararam conhecê-lo, porém a apresentação da equipe foi realizada por 53,3%. O *time out* foi executado por 86,7%, enquanto os critérios de vigilância para infecção de sítio cirúrgico eram desconhecidos por 93,3%. **Conclusão:** identificou-se limitações no conhecimento dos enfermeiros em medidas durante o transoperatório, especialmente quanto à tricotomia, preparo da pele do paciente e do cirurgião, e aquecimento do paciente. Nas etapas e itens do *checklist*, observou-se lacunas na apresentação da equipe e execução do *time out*, além dos critérios para diagnosticar infecção de sítio cirúrgico.

Palavras-chave: Conhecimento. Centro cirúrgico. Infecção de sítio cirúrgico. Cirurgia segura. Enfermagem perioperatória.

CONOCIMIENTO DE ENFERMEROS SOBRE PREVENCIÓN DE INFECCIÓN DEL SITIO QUIRÚRGICO Y CHECKLIST DE CIRUGÍAS SEGURAS

RESUMEN

Objetivo: evaluar el conocimiento de enfermeras del centro quirúrgico sobre las medidas de prevención de infección de sitio quirúrgico durante el transoperatorio y sobre la lista de verificación de cirugía segura. Método: estudio transversal, realizado con 30 enfermeros que trabajan en centros quirúrgicos de 30 grandes hospitales de Minas Gerais/Brasil, entre febrero de 2018 y abril de 2019. **Resultados:** con respecto a las medidas transoperatorias, 60% de los enfermeros reportaron realizar la tricotomía en quirófano, siendo que 36,7% utilizaron láminas; 60,9% indicaron la preparación quirúrgica adecuada de las manos del cirujano; 10% desconocían los procedimientos para la preparación de la piel del paciente; y 70% no implementaron la práctica de calentamiento del paciente. En cuanto a la lista de verificación, el 93,3% declaró conocerlo, pero la presentación del equipo fue realizada por el 53,3%. El time out fue ejecutado por el 86,7%, mientras que los criterios de vigilancia para la infección del sitio quirúrgico eran desconocidos por el 93,3%. **Conclusión:** se identificaron limitaciones en el conocimiento de los enfermeros en medidas durante el transoperatorio, especialmente en cuanto a la tricotomía, preparación de la piel del paciente y del cirujano, y calentamiento del paciente. En las etapas e ítems de la lista de verificación, se observaron lagunas en la presentación del equipo y ejecución del time out, además de los criterios para diagnosticar infección de sitio quirúrgico.

Palabras clave: Conocimiento. Centro quirúrgico. Infección de sitio quirúrgico. Cirugía segura. Enfermería perioperatoria.

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