



Overview of the Implementation of the Surgical Safety Checklist Among Anesthesia Practitioners in Indonesia

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ABSTRACT

Background: The Surgical Safety Checklist (SSC) is an essential tool to improve patient safety and reduce surgical complications. This study aimed to provide an overview of the implementation of the Surgical Safety Checklist among anesthesia practitioners in Indonesia.

Methods: This study employed a descriptive quantitative design with a cross-sectional approach. A total of 369 anesthesia practitioners were selected using a cluster sampling technique. Data were collected using a structured questionnaire consisting of 30 items covering three phases of SSC implementation: sign-in, time-out, and sign-out. Data were analyzed using univariate analysis and presented as frequency distributions and percentages.

Result: The results showed that the majority of respondents were male (54%), aged ≤30 years (52%), had a Diploma IV level of education (59%), and had participated in patient safety training (70%). The implementation of SSC was categorized as good in the sign-in phase (71%), followed by the sign-out phase (60%) and the time-out phase (55%), which had the lowest compliance level.

Conclusion: In conclusion, the implementation of the Surgical Safety Checklist among anesthesia practitioners in Indonesia is generally good but not yet optimal, particularly in the time-out and sign-out phases. Continuous training, supervision, and institutional support are recommended to improve consistency and completeness in SSC implementation, thereby enhancing patient safety and reducing the risk of surgical complications.

Keywords: Surgical Safety Checklist, Anesthesia Practitioners, Patient Safety, Compliance, Operating Room.

INTRODUCTION

Patient safety is currently a primary concern for healthcare providers, particularly for patients receiving anesthesia services. Anesthesia is considered a high-risk procedure that requires strict safety measures to ensure optimal surgical outcomes and prevent adverse events during perioperative care. Therefore, ensuring patient safety in anesthesia practice is a critical responsibility for all healthcare professionals involved, including anesthesia practitioners. The Surgical Safety Checklist (SSC) is an important tool developed to enhance surgical safety and reduce mortality and complications associated with surgical procedures (Klase et al., 2016). The implementation of the SSC involves multidisciplinary collaboration, including surgeons, nurses, and anesthesia practitioners, who play a crucial role in ensuring patient safety throughout the surgical process. The proper use of SSC has been shown to improve the quality and safety of surgical care (Purwanti et al., 2022). Evidence from a multicenter study conducted in eight hospitals worldwide demonstrated that the implementation of SSC significantly reduced mortality rates from 1.5% to 0.8% and complication rates from 11.0% to 7.0% (Haynes et al., 2009).

Despite its proven benefits, the implementation of SSC in clinical practice remains suboptimal in many settings. A study conducted by Molina et al. (2016) in South Carolina hospitals found that only 54.1% of surgical teams consistently used SSC, even though 73.6% acknowledged its effectiveness in preventing complications. Similarly, research by Sendlhofer et al. (2015) at the University Hospital Graz, Austria, reported high overall usage (95.3%), but variations were observed among professional groups, with anesthesia practitioners and surgical nurses demonstrating different levels of compliance compared to surgeons and anesthesiologists. In Indonesia, the implementation of SSC also shows varying results and is not yet optimal. Sandrawati et al. (2013) reported that SSC implementation in operating rooms was still relatively low at 55.9%. Another study by Selano et al. (2019) found that 78.3% of SSC forms were incompletely filled. Similarly, Yuliati et al. (2019) reported that SSC implementation in a hospital setting was still inadequate at 52.2%. In contrast, Klase et al. (2016) found that 90.5% of operating room personnel perceived the WHO SSC as easy to implement. Furthermore, a study by Darmapan et al. (2022) in Bali Province showed that anesthesia practitioners demonstrated good compliance in implementing SSC (96.1%). However, another study by Karniawan (2020) found that although SSC implementation was generally good, compliance behavior was only 68.33%, indicating inconsistencies in practice.

The Surgical Safety Checklist is an essential component that must be consistently implemented by anesthesia practitioners to prevent adverse events during surgical procedures. Its application has been proven to reduce complications related to both surgery and anesthesia, as well as to improve teamwork among healthcare providers (Haugen, Sevdalis, & Søfteland, 2019). However, challenges remain, particularly in the consistent implementation of SSC at critical stages such as sign-in, time-out, and sign-out. Given the important role of anesthesia practitioners in maintaining patient safety during surgical procedures, it is necessary to explore how SSC is implemented in practice. Therefore, this study aims to provide an overview of the implementation of the Surgical Safety Checklist among anesthesia practitioners in Indonesia. The findings of this study are expected to contribute to the development of policies and programs to optimize SSC implementation and improve patient safety outcomes.

METHODS

This study employed a descriptive quantitative research design with a cross-sectional approach conducted in Indonesia. The study aimed to provide an overview of the implementation of the Surgical Safety Checklist (SSC) among anesthesia practitioners. The population in this study consisted of all anesthesia practitioners in Indonesia, totaling 4,741 individuals. The sample size was determined using a sample size calculation formula with a 5% margin of error, resulting in 369 respondents. The sampling technique used was cluster sampling, in which respondents were selected based on regional distribution across Indonesia. The inclusion criteria were: (1) anesthesia practitioners working in government or private hospitals, (2) having a valid registration certificate (STR) as an anesthesia practitioner, and (3) willingness to participate in the study. The exclusion criteria were anesthesia practitioners who were not willing to become respondents or did not complete the questionnaire.

Data were collected using a structured self-administered questionnaire designed to measure the implementation of the Surgical Safety Checklist. The questionnaire consisted of 30 statements divided into three phases of SSC implementation: sign-in, time-out, and sign-out, with 10 statements for each phase. Each item assessed the level of implementation of SSC practices in clinical settings. Prior to data collection, the instrument was tested for validity and reliability to ensure its accuracy and consistency. Data collection was conducted online to facilitate broader participation from anesthesia practitioners across different regions in Indonesia.

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS). Univariate analysis was used to describe the distribution of respondents' characteristics and the level of SSC implementation in each phase. The results were presented in the form of frequency distributions, percentages, and descriptive summaries.

RESULTS

Table 1. Frequency distribution of respondent characteristics (n = 369).

Respondent Characteristics	Frequency (f)	Percentage (%)
Sex		
Male	201	54
Female	168	46
Usia		
≤ 30 Year	194	52
>30 Year	175	48
Last Education		
D III	106	29
D IV	221	59
S1	36	10
S2	6	2
DPD IPAI		
Bali	203	55
Sumatra Utara	123	33
Maluku Utara	43	12
Patient safety training		
Yes	260	70
No	109	30

Based on Table 1, the characteristics of respondents regarding gender, the majority of respondents were male, namely 201 (54%).

Table 2. Implementation of the Surgical Safety Checklist during the sign-in phase among anesthetists in Indonesia (n = 369).

Implementation Category	Frequency (f)	Percentage (%)
Good	260	71
Not Good	109	29

Based on Table 2, it can be seen that as many as 260 (71%) anesthetists carried out the Surgical Safety Checklist in the sign-in phase well. Meanwhile, 109 (29%) other anesthetists carried out the Surgical Safety Checklist during the sign-in phase poorly. The results of this study indicate that the majority of anesthetists implemented the Surgical Safety Checklist at the sign-in phase in the good category.

Table 3. Implementation of the Surgical Safety Checklist in the time-out phase among anesthetists in Indonesia (n = 369).

Implementation Category	Frequency (f)	Percentage (%)
Good	203	55
Not Good	166	45

Based on Table 3, it can be seen that as many as 203 (55%) anesthetists carried out the Surgical Safety Checklist in the time-out phase well. Meanwhile, 166 (45%) other anesthetists carried out the surgical safety checklist during the time-out phase poorly.

Table 4. Implementation of the Surgical Safety Checklist at the sign-out phase for anesthesia practitioners in Indonesia (n = 369).

Implementation Category	Frequency (f)	Percentage (%)
Good	220	60
Not Good	149	40

Based on Table 4, it can be seen that as many as 220 (60%) anesthetists carried out the Surgical Safety Checklist in the sign-out phase well. Meanwhile, 149 (40%) other anesthetists carried out the surgical safety checklist during the sign-out phase poorly.

DISCUSSION

The results of this study indicate that the majority of respondents who complied with the implementation of the Surgical Safety Checklist were male. This suggests that gender may influence compliance with SSC implementation. Men are often considered to have stronger physical and mental readiness to handle the high demands of the operating room, where all actions must be performed quickly, accurately, and in a well-coordinated manner. However, these findings are not entirely consistent with other studies that report no significant differences between men and women in terms of work roles, productivity, or job satisfaction. This implies that both men and women essentially have equal potential in carrying out their professional responsibilities, and that differences in compliance may be influenced by factors beyond gender.

In addition, based on the respondents' educational background, the majority held a D-IV level of education. A higher level of education enables individuals to more easily receive and understand health-related information, leading to broader knowledge. This, in turn, supports better decision-making abilities and contributes to greater compliance in implementing safety procedures such as the Surgical Safety Checklist. Even though the majority of anesthetists only have D-IV education, they still carry out SSC well. This is because the Surgical Safety Checklist is an examination that must be carried out to prevent unwanted events. In fact, based on the Regulation of the Minister of Health of the Republic of Indonesia No. 1691 of 2010 concerning hospital patient safety, it is required that the implementation of the surgical safety checklist in the operating room be 100% to eliminate worrying problems and the possibility of errors being resolved in the operation. Characteristics of respondents in this study, the majority of whom participated in patient safety training: 260 people (70%). According to Yuliati et al. (2019), there is a significant relationship between training and the implementation of the surgical safety checklist. This is because all the training provided becomes the basis for nurses to implement patient safety. Successful implementation of the surgical safety checklist depends on staff training to increase knowledge and compliance. This training, such as basic life support, is an absolute requirement for an anesthetist in the operating room. The training provided becomes the basis for anesthesia practitioners to implement patient safety.

This research is in line with Melekic & Getahun (2015), who stated that the sign-in phase at SSC is the phase that is best and most often done. This indicates that the majority of anesthetists have carried out a thorough sign-in in accordance with the surgical safety checklist according to WHO 2008, which includes checking the patient's identity before induction, ensuring the operation side, re-confirming the action plan to be carried out on informed consent, ensuring the anesthesia machine and equipment monitoring function well, assessing airway difficulties, and confirming the patient's allergy history. However, there is a point that is rarely made, namely that the anesthesia practitioner ensures that blood products are available. This is supported by Dwiyanti and Jati (2019), who state that signing in is a preparatory stage for surgery to identify patients, where the anesthesia nurse plays a role in this. The results of this study were also supported by the majority of anesthesia practitioners answering always and often to all statement items regarding sign-in implementation.

The results of this study indicate that the majority of anesthesia practitioners implemented the Surgical Safety Checklist in the time-out phase in the good category. This research is in line with Mawaddah et al. (2018), who found that some respondents carried out time out well, with all members of the operations team starting the time out by stating their names and roles in the operation to ensure that all teams were in the same operating room that would be used. According to WHO (2008), time out is a phase where each member of the operations team introduces themselves and explains their respective roles. In this study, the majority of anesthetists had implemented time outs in accordance with the surgical safety checklist according to WHO 2008, such as anesthetists ensuring the patient's position before incision, monitoring closely during the anesthesia procedure, anesthesia directors ascertaining factors complicating the anesthesia procedure, and anesthesia directors estimating the duration of anesthesia. However, there are points that are rarely done, such as introducing yourself, reading the patient's name again, and ensuring that antibiotic prophylaxis has been given 1 hour before the procedure. The operator must ensure that everyone in the operating room knows each other. Before making the first incision in the skin, the operator confirms in a loud voice that they are performing the appropriate surgical procedure on the right patient and that the incision is in the

right place. Don't forget to confirm that prophylactic antibiotics have been given 1 hour before the incision. The results of this study are also supported by the majority of anesthesia nurses always answering all statement items regarding time out. This research is in line with Mawaddah et al. (2018), which state that time out is started by all members of the operating team by stating their respective names and roles in the operation to ensure that all teams are in the same operating room that will be used.

The results of this study indicate that the majority of anesthetists carry out the surgical safety checklist in the sign-out phase well. The same results were shown by previous researchers, who stated that the majority of respondents carried out the surgical safety checklist in the good category at the sign-out phase (Hermawan et al., 2014). According to WHO (2008), sign-out is a phase before removing the patient from the operating room, where several points of the SSCs are carried out to facilitate the transfer of information related to the patient's caregivers, especially after surgery. The results of this study are also supported by the majority of anesthetists, who always answer several statement items regarding sign-out. However, there are points that are rarely done, such as the anesthesia director carrying out a handover with the inpatient/ICU nurse, the anesthesia director and the entire team involved in discussing the patient's recovery plan, the anesthesia director conveying important things related to the patient's recovery to the team members, and the anesthesia director writing down the date and verification hours related to patient care in the treatment room.

In this study, the majority of anesthetists carried out a thorough sign-out in accordance with the surgical safety checklist according to WHO 2008, which includes carrying out a sign-out before the patient is transferred to the recovery room, recording important events during the intra-anesthesia procedure, assessing the patient's level of consciousness, and assessing the presence of obstructions, breathing, collaborating with the anesthetist to determine pain management, conducting discussions between the team for the patient's recovery plan, checking the patient's hemodynamics before going to the recovery room, writing down the verification date and time regarding patient care in the treatment room, and carrying out handovers with the inpatient/ICU nurses. The sign-out phase has an important role and needs to be implemented as well as possible to protect patients from unwanted events. This is because the effects of anesthetic drugs can have a bad impact on the patient and ignore patient safety. If post-operative care related to anesthesia treatment is not carried out properly, then the patient can become a victim. Therefore, checking patient safety using the surgical patient safety sign-out phase is very important to do (Hermawan et al., 2014).

CONCLUSION

The implementation of the Surgical Safety Checklist (SSC) among anesthesia practitioners in Indonesia is generally good across all phases, with the highest compliance observed in the sign-in phase, followed by sign-out and time-out, although it has not yet reached optimal levels. These findings suggest that while practitioners demonstrate adequate knowledge and practice, particularly in the preparation stage, there are still gaps in consistency, especially in the time-out and sign-out phases that involve critical communication, coordination, and documentation. Compliance is influenced by factors such as education level and participation in patient safety training, which supports better implementation. However, incomplete adherence to several checklist components indicates the need for ongoing training, strengthened supervision, and institutional support. Therefore, it is recommended that healthcare institutions enhance regular training programs, reinforce monitoring systems, and standardize SSC implementation to improve consistency and maximize patient safety outcomes.

REFERENCE

- Darmapan, S. A., Nuryanto, K. N., & Yusniawati, Y. N. P. Y. (2022). Kepatuhan Penata Anestesi Dalam Penerapan Dokumentasi Menggunakan Surgical Safety Checklist Di Ruang Operasi. *Jurnal Riset Kesehatan Nasional*, 6(1), 61-66. <https://doi.org/https://doi.org/10.37294>
- Dwiyanti, I. A. I., & Jati, I. K. (2019). Asuhan keperawatan pasien dengan gangguan persepsi sensori halusinasi pendengaran dalam pemenuhan kebutuhan psikologis Doni. *Tjyybjb. Ac. Cn*, 27(2), 58-66.

- Haugen, A. S., Sevdalis, N., & Søfteland, E. (2019). Impact of the World Health Organization surgical safety checklist on patient safety. *Anesthesiology*, 131(2), 420-425. <https://doi.org/10.1097/ALN.0000000000002674>
- Haynes, A. B., Weiser, T. G., Berry, W. R., Lipsitz, S. R., Breizat, A. H. S., Dellinger, E. P., ... & Gawande, A. A. (2009). A surgical safety checklist to reduce morbidity and mortality in a global population. *New England journal of medicine*, 360(5), 491-499. <https://doi.org/10.1056/NEJMsa0810119>
- Hermawan, I., Saryono, & Santoso, D. (2014). Gambaran penerapan surgery patient safety fase sign out pada pasien post operasi bedah mayor di Instalasi Bedah Sentral RSUD Kebumen. *Jurnal Ilmiah Kesehatan Keperawatan*, 10(3), 124-132. <http://ejournal.unimugo.ac.id/JIKK/article/viewFile/128/120>
- Karniawan, W. (2020). *Analisis kepatuhan penerapan surgical safety checklist berdasarkan Theory of Planned Behavior pada pasien bedah di RSUD Andi Makkasau Kota Parepare [Thesis]*. Program Studi Magister Ilmu Keperawatan Fakultas Keperawatan, Universitas Hasanuddin.
- Klase, S., Pinzon, R. T., & Meliala, A. (2016). Penerapan Surgical Safety Checklist WHO di RSUD Jaraga Sasameh Kabupaten Barito Selatan. *Berkala Ilmiah Kedokteran Duta Wacana*, 1(3), 173-181. <https://doi.org/10.21460/bikdw.v1i3.25>
- Mawaddah, N., Syurandhari, D. H., & Basahi, H. (2018). Faktor-faktor yang mempengaruhi kepatuhan perawat terhadap penerapan surgical patient safety fase time out di instalasi bedah sentral Rsud Dr Moh Shaleh Kota Probolinggo. *Medica Majapahit*, 10(2), 100-110.
- Melekie, T. B., & Getahun, G. M. (2015). Compliance with surgical safety checklist completion in the operating room of university of gondar hospital, Northwest Ethiopia. *BMC Research Notes*, 8(1), 1-7. <https://doi.org/10.1186/s13104-015-1338-y>
- Molina, G., Jiang, W., Edmondson, L., Gibbons, L., Huang, L. C., Kiang, M. V., ... & Singer, S. J. (2016). Implementation of the surgical safety checklist in South Carolina hospitals is associated with improvement in perceived perioperative safety. *Journal of the American College of Surgeons*, 222(5), 725-736. <https://doi.org/10.1016/j.jamcollsurg.2015.12.052>
- Saputra, C., Purwanti, N., Guna, S. D., Azhar, B., Malfasari, E., & Pratiwi, P. I. (2022). Faktor Penerapan Surgical Safety Checklist di Kamar Operasi. *Jurnal Keperawatan*, 14(1), 291-300.
- Sandrawati, J., & Supriyanto, S. (2013). Recommendations to improve the implementation compliance of surgical safety checklist in surgery rooms. *Buletin Penelitian Sistem Kesehatan*, 17(1), 20883. https://repository.unair.ac.id/118690/1/Jurnal_C20
- Selano, M. K., Kurniawan, Y. H., & Sambodo, P. (2019). Hubungan Lama Kerja Perawat Dengan Kepatuhan Pengisian Surgical Safety Checklist di Instalasi Bedah Sentral. *Jurnal Kepemimpinan dan Manajemen Keperawatan*, 2(1), 16-22.
- Sendlhofer, G., Mosbacher, N., Karina, L., Kober, B., Jantscher, L., Berghold, A., ... & Kamolz, L. P. (2015). Implementation of a surgical safety checklist: interventions to optimize the process and hints to increase compliance. *PLoS One*, 10(2), e0116926. <https://doi.org/10.1371/journal.pone.0116926>
- Widiyaningsih, W., Kusyati, E., & Hidayat, A. (2018). Hubungan pelaksanaan surgical safety checklist dan kejadian infeksi post operasi mayor. *Journal of Health Science (Jurnal Ilmu Kesehatan)*, 2(1), 29-33. <https://doi.org/10.24929/jik.v2i1.394>
- WHO. (2008). *Implementation manual surgical safety checklist*. Geneva: WHO. <https://apps.who.int/iris/bitstream/handle/10665/70046>
- Yuliati, E., Malini, H., & Muharni, S. (2019). Analisis Faktor Yang Berhubungan Dengan Penerapan Surgical Safety Checklist Di Kamar Operasi Rumah Sakit Kota Batam. *Jurnal Endurance*, 4(3), 456-463. <https://doi.org/http://doi.org/10.22216/jen.v4i3.4501>