A model for developing a surgical and anaesthesia safety checklist in reducing surgical morbidity and mortality: a literature review

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Abstract. Complications that often occur include patient/procedure/surgery site errors, anaesthesia equipment problems, lack of availability of necessary equipment, unexpected blood loss, unsterile equipment, and surgical objects left inside the patient. A surgical checklist can prevent errors and complications that may occur during surgery or perioperatively. The objective is to ascertain the various models of surgical and a naesthesia patient safety checklist instrument and their development. This will facilitate the improvement of compliance with critical patient care in surgical cases through the implementation of surgical and anaesthesia patient safety checklist instruments. This research is a review of related literature and a and a comprehensive study of relevant phenomena. Search and collect literature using the Google Chrome search engine with the keywords Surgical and Anesthesia Patient Safety Checklist. Selection and review adhered to Preferred Reporting Items for Systematic Reviews guidelines. The final review analysis included 25 articles that will be analysed in this review. No significant differences were found regarding morbidity, but there were complications such as infection, bleeding, stroke, and other complications. This study also found that 27.1% of patients did not receive surgical safety checklist training, highlighting the importance of training in patient safety and the use of surgical safety checklists to improve safety and effectiveness in dealing with complications and quality of care. Implementation of a surgical safety checklist increases efficiency, cost reduction, and patient safety. Evaluating and coaching patients before, during, and after procedures is critical to improving patient safety. A surgical safety checklist is important for improving quality and patient safety, but its implementation requires appropriate training programs and the development of patient safety checklists.

1 Introduction

The percentage of patients who pass away after surgery and anesthesia, depending on the day of the procedure, within 30 days of the procedure, or even on the current day of hospital

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discharge, is known as the Perioperative Mortality Rate (POMR). It serves as an estimate of the availability of safe surgery and anesthesia. More access to contemporary anesthesia care and surgical care is favorably correlated with the perioperative mortality rate [1]. For this reason, POMR is one of the 100 essential health indicators listed by the World Health Organization [2]. Although surgery is the most common kind of medical intervention in developed countries. The hospitalized perioperative mortality rate is 0.4-0.8%, and the complication rate due to surgery is estimated at 3-17%. In addition to having a major social and monetary consequences, unintended health impacts are a major cause of disease and mortality. According to predictions, adverse occurrences occur around 4% and 17% of the time, with about 50% of them being preventable. This is rising, with a range of 10.3% to 23.2%. For this reason, POMR is one of the 100 essential health indicators listed by the World Health Organization [2].

Complications that happen include the incorrect patient/procedure/surgical site, anaesthetic problems related to equipment, a lack of required equipment, unexpected blood loss, contaminated equipment for use, and surgical procedure objects (e.g., sponges) left within the patient. To prevent these catastrophes, the intricacy of most surgical operations necessitates the cooperation of a multidisciplinary team. Surgical checklists can help to avoid errors and complications during surgery and the postoperative period. To date, various efforts have been made to improve patient safety. For example, it was found that training surgical teams on how to communicate between professions and peers had a significant reduction in patient mortality due to surgery [3].

Surgical checklists can improve compliance in critical patient care in surgical cases. Numerous studies have demonstrated the benefits of surgical checklists, which include lowering errors, guaranteeing that all necessary activities are completed, promoting a non-hierarchical team-based approach, improving communication, identifying errors earlier, anticipating potential complications, and having the technology to manage anticipated and unanticipated operations and minimize surgical complications [4].

According to WHO (2009), the surgical checklist includes 22 components, including patient identification, anaesthetic equipment inspection, and pulse oxygen saturation monitoring. Before making a skin surgical incision, cover topics involving team introduction, an overview of necessary processes, antibiotics, and prophylaxis. Before the patient moves away from the operating room, perform tasks such as counting the number of equipment, marking specimens, and paying attention to recovery. There are various surgical and anaesthesia checklists, such as the WHO Surgical Safety Checklist (SSC), the Surgical Patient Safety System (SURPASS) checklist, a wrong-site surgery checklist, and an anesthesia equipment checklist. The WHO SSC surgery patient protection checklist has several advantages, including primarily pre/post-application designs without controls, no evidence of an impact on the duration of stay, and no evidence of related cost reductions [5].

The Surgical Patient Safety System (SURPASS) checklist has some limitations, such as requiring antibiotic prophylaxis for at least thirty minutes prior to incisions. Nevertheless, is not guaranteed when antibiotic prophylaxis is administered. The way the checklist is used is also less than optimal which can be overcome with more education [6].

Based on the results of a temporary study conducted in several hospitals in Indonesia, both public and private, the use of surgical *checklists* is still limited to using the *Surgical Safety Checklist* (SSC). Based on the study's findings, this Surgical Safety Checklist has the potential to minimize surgical complications and death by up to 30%. SSC, which is relatively *simple* and communicative, provides the benefit of reducing the number of complications and deaths, but its application in the operating room is still relatively low. This is certainly contrary to the Regulation No. 11 of 2017 concerning Patient Safety and Decree No. 1128 of 2022 concerning Hospital Accreditation Standards and the Hospital Accreditation Committee (KARS) requiring 100% implementation of SSC in the operating room. Based on the results

of previous studies obtained data that compliance with SSC filling is also not fully compliant with limited human resource factors, officers forget or neglect the use of *surgical safety checklists*, lack of understanding of *surgical safety checklists,* and operator factors that rarely provide antibiotic prophylaxis. Forgetting can lead to medical errors that have an impact on patients resulting in decreased *patient safety*.

Survey results obtained in several hospitals in the Indonesian region showed that health workers (nurses and anaesthetists) held (as of least briefly prior to the closure of the operation) filled in everything, involving "specimens are correctly labelled" considering that the specimens had been sent remain in the patient, and had also filled in the backside of the application (equipment qualify chart), regardless all equipment used in the operation was freshly sterilized and finished the checklist's exit column, without speaking to anyone. Another observation obtained was that the *Time Out* was done in a hurry, even done by the anaesthetist after the surgeon had left the operating room. Based on the results of observations, it was also found that in emergency operations SSC was not carried out, lack of human resources, and even too many human resources were not carried out SSC. There are some differences in perception of the use of SSC and consider that SSC is a waste of time. The use of SSC has not been able to accommodate all the needs of equipment and machinery and anesthetic drugs needed and there is no standard instrument regarding surgery and anaesthesia specifically for the field of anaesthesia because it is still integrated with surgery. The researcher wants to create a checklist model for surgery and anesthesia based on this foundation.

This study's goals are divided into two categories: general goals and particular goals. Examining different surgical and anesthetic safety checklist (SSC) instrument development methodologies is the shared objective. The specific goals are threefold: first, to identify factors that influence the occurrence of medical errors, with a focus on patients, human resources, and the environment; second, to identify factors that affect the implementation of SSC usage, with a focus on perceptions and compliance levels; and third, to investigate various development models for surgical and anesthesia safety checklists. These goals seek to offer a thorough grasp of SSC development and its application in real-world settings to improve patient safety and the standard of healthcare.

2 Methods

In conducting a literature review, it must be ensured that the sources used are from sources that are credible and relevant to the research topic and that the literature used has been examined and accepted by the scientific community. The main sources of literature were obtained from search results in three electronic databases, namely Pubmed National Center for Biotechnology Information (NCBI), Directory of Open Access Journals (DOAJ) and ScienceDirect. The search was limited to the period of 2019-2024 relevant to the topic, at least 80% of journal articles (national/international) are reputable and at least 20% are from textbooks, international/national reports, research reports, dissertations, and theses.

The selection of topics must also be focused, specific and have a high contribution relevance to the field of study to be researched related to the "*Surgical and Anesthesia Patient Safety Checklist*". Once the topic is selected, the next step is to conduct a literature search relevant to the topic. The arguments should be based on the findings of the collected literature supported by valid facts and data from reliable sources. This process involves an in-depth analysis of each source relevant to the research topic.

Literature collection was conducted through a search process to obtain relevant sources and any connected references. The keywords used were *Surgical* AND *Anesthesia Patient Safety Checklist*, while the boolean operator used the word "*AND*" with the aim of narrowing

the search results in the database so that all keywords used must be found in the article so that it appears in the list of search results.

Further screening and selection were done by reviewing the titles and abstracts of all retrieved references by first using the inclusion criteria. Studies relevant to the topic based on the inclusion criteria were subjected to full-text review.

This literature review follows the Preferred Reporting Items for Systematic Reviews (PRISMA) criteria. The review was divided into three stages: identifying articles from database sources (authentication), filtering papers based on inclusion requirements (eligibility), namely utilizing the Surgical Safety Check List in medical care, including those related to anaesthesia, and determining articles that are suitable for the research plan design, namely developing a patient safety model with anaesthesia actions in the hospital. The literature used in this study flows as follows:

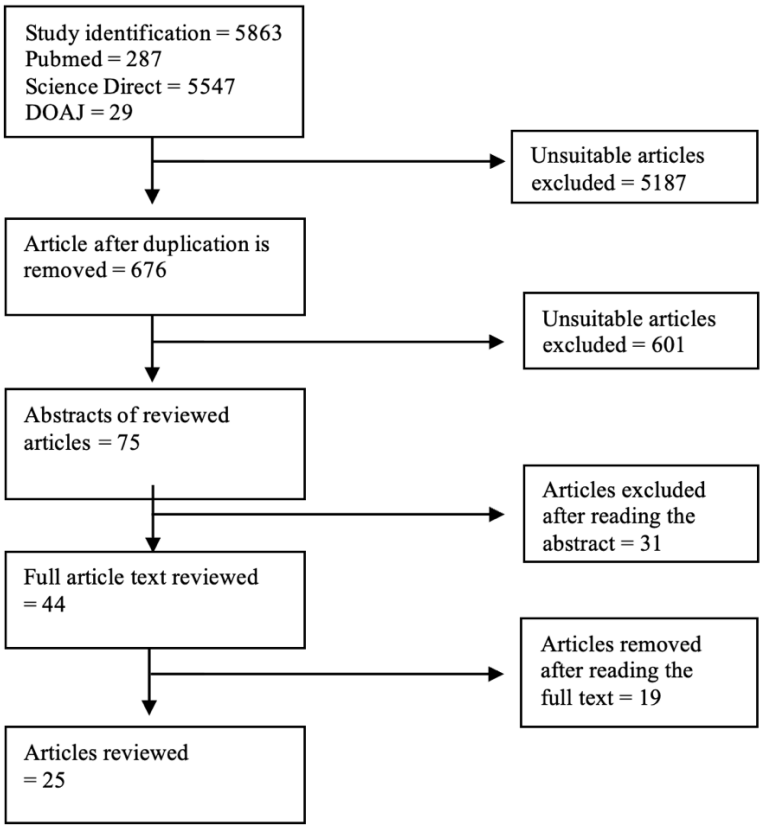

Fig. 1. PRISMA Selection Flow.

3 Results

The first step in the selection process was to find 5,863 articles from ScienceDirect (5,547 articles), DOAJ (29 articles), and PubMed (287 articles). 676 articles were left for additional screening after duplicate entries were eliminated. Of these, 676 papers were selected for preliminary assessment after 5187 were rejected as inappropriate. Following a study of the abstracts of 75 papers, 601 more publications were excluded on the basis of their relevancy. Nineteen articles were deemed ineligible for inclusion after the entire texts of forty-four

chosen papers were examined. Ultimately, the survey contained 25 publications for in-depth examination. Table 1 below provides a summary of the findings from the PRISMA method article review.

Table 1. Surgical Patient Safety Checklist Review Matrix

No	Author(s)	Study Objective	Study Design	Key Findings
1	Haugen et al. [4]	Evaluate the impact of WHO SSC on care processes and patient outcomes in Norway.	Randomized Controlled Cluster	Improved care processes, reduced complications (e.g., infections, bleeding), cost efficiency, and high compliance.
2	Ramsay et al. [7]	Assess the impact of WHO SSC on surgical mortality in Scotland.	Population Cohort Study	36.6% reduction in surgical mortality rates after SSC implementation.
3	Chhabra et al. [8]	Examine WHO SSC's role in reducing morbidity and mortality in tertiary hospitals.	Observational Study	Reduced infections, wound disruptions, and sepsis.
4	Guris et al. [9]	Train novice anesthesiology trainees to improve patient safety.	Prospective Observational	Improved trainee communication, self-efficacy, and assertiveness through simulation.
5	Tiruneh & Yetneberk [10]	Assess adherence to WHO SSC in Ethiopian hospitals.	Longitudinal Study	82.1% compliance rate; deficiencies in components like "sign-out" were noted.
6	Allene [11]	Audit WHO SSC implementation in Debre Berhan hospital.	Observational Cohort Study	Identified missed critical steps; recommended training and regular audits.
7	Storesund et al. [5]	Assess the combined use of WHO SSC and SURPASS checklist.	Nonrandomized Clinical Trial	Improved outcomes, reduced reoperations and readmissions, no impact on hospital stay length.
8	De Bie et al. [12]	Compare digital and paper checklists in ICUs.	Mixed-Methods Study	Enhanced adherence, fewer antibiotics, and shorter ICU stays; usability of digital checklists needs improvement.
9	Correa et al. [30]	Analyze patient safety incidents in endoscopy units.	Retrospective Analysis	Low harm rate, common issues included patient misidentification and incixdent reporting gaps.
10	Harris et al. [14]	Develop a surgical safety checklist based on patient and healthcare worker input.	Qualitative Study	Highlighted patient involvement, better pre-/post-operative information needed.
11	Röhsig et al. [15]	Enhance WHO SSC compliance in Brazilian hospitals.	Quality Improvement Study	Compliance reached 89% after training and local customization.
12	Moore et al. [16]	Audit postoperative outcomes before and after WHO SSC implementation.	Retrospective Audit	No significant improvement in 30-/90-day mortality; emphasized disparities in outcomes among ethnic groups.
13	Jaulin [17]	Evaluate the impact of the PATH checklist in	Pre-Post Study Design	Reduced hypoxemia and improved nurse satisfaction;

		post-anesthesia recovery.		highlighted the importance of structured handovers.
14	Urban et al. [18]	Explore healthcare professionals' perceptions of WHO SSC.	Multinational Survey	Checklist improves teamwork, but gaps exist in leadership roles and training.
15	Mihretu [19]	Assess anesthesia safety in Ethiopian hospitals.	Cross-Sectional Survey	Highlighted low adherence to SSC and lack of essential equipment in district hospitals.
16	Sibhatu et al. [20]	Examine compliance and completeness of WHO SSC in Ethiopia.	Nationwide Cross-Sectional	Compliance rate 60.8%; surgeries using SSC saw reduced perioperative mortality.
17	Harris et al. [21]	Develop and validate a patient-filled surgical safety checklist (PASC).	Intervention Development	PASC checklist improves patient engagement; further evaluation required for effectiveness.
18	Meersch et al. [22]	Investigate effects of anesthesia handovers on mortality and complications.	Randomized Controlled Trial	No significant differences found in mortality or complications between handover and non-handover groups.
19	Batista [23]	Assess the impact of checklists on surgical duration in arthroplasty.	Cross-Sectional Study	Reduced surgical duration; checklists improved efficiency without increasing operation time.
20	Bozkurt & Tüzer [24]	Examine near-misses and SSC use by surgical teams.	Descriptive Study	SSC prevented 37% of near-misses; emphasized need for training and positive feedback.
21	Gul et al. [25]	Assess WHO SSC adherence in a specific hospital.	Clinical Audit	Improved compliance after education; barriers included lack of training and motivation.
22	Harris et al. [26]	Evaluate feasibility of patient-driven safety checklist.	Prospective Cross-Sectional	50.2% completion rate; patients found checklists helpful; identified barriers and drivers for checklist usage.
23	Ilorah et al. [27]	Assess SSC use in neurosurgery in South Africa.	Cross-Sectional Quantitative	Identified barriers such as time constraints; training improved SSC adherence.
24	Looke et al. [28]	Compare dynamic and static pre-anesthesia safety checklist approaches.	Pragmatic Trial	Dynamic approach improved adherence and reduced errors; barriers included time pressure and team support issues.
25	WHO Multicenter Study [29]	Assess SSC and anesthesia equipment checklist in war-affected areas.	Multicenter Prospective Study	Improved safety measures and reduced complications in resource-constrained settings.

4 Discussion

Based on the above table, the use of *SSC* was associated with increased preventive measures that were shown to effectively prevent several types of medical errors. Regarding the incidence of mortality, reduction 36,6% in the surgical patients [7]; readmission, and serious complications between the handover group and the group without postoperative handover, there was no significant difference [21], but there were postoperative complications including infection, bleeding, heart attack, stroke, and other complications [4]. There were several key barriers to the implementation of SSC including a lack of awareness, training, and motivation among surgical staff [25] with 27.1% of surgical team members receiving no training on SSC [24]. During service training on patient protection and the use of SSC to increase consciousness and compliance, including the application of safety measures to improve the quality of treatment [29] emphasized in the study [16]. Therefore, service training and lowering postoperative complications require the usage and training of SSC [18].

The above study emphasized the importance of evaluating surgical outcomes related to mortality rates including clinical experience and preference for the use of digital checklists compared to paper checklists [12]. The content validity and reliability of the SSC were rated highly by patients and healthcare professionals [14]. However, further evaluation is needed to determine its effectiveness in improving surgical outcomes [21], identifying areas for improvement and barriers to implementation (28), and suggesting the need for further research to assess the impact of SSC on complications and mortality [26].

The use of checklists as a useful communication tool for increasing patient safety during surgery [8], a tool to improve efficiency [31], an important strategy inpreventing errors and improving patient safety [13], so that attention and follow-up are needed to improve the completeness of checklists [10] because there are still areas that require further attention to ensure better patient safety [19]. Additionally, the importance of increasing compliance with safety protocols [20] includes staff awareness, education, and positive attitudes in the effective implementation of surgical checklists [27]. Speaking up in the healthcare environment [9] so that the quality of patient monitoring and information transfer contributes to better clinical outcomes [17].

The results showed no significant difference in the incidence of mortality, readmission, and serious postoperative complications between the handover group and the no-handover group [21]. When the SURPASS checklist and WHO operative Safety Checklist were used together, operative outcomes were better than when the WHO SSC had been employed alone. In particular, fewer emergency reoperations and less surgical complications were linked to the checklist's combined use [6]. Prior to the educational intervention, adherence to the WHO SSC was significantly lower [15]. However, following the educational intervention, there was a significant increase in adherence to the various components of the checklist [11]. Overall, the comparison's findings imply that using a more thorough assessment and instructional intervention can enhance surgical results and safety procedure adherence.

5 Conclusion

Based on the results of various literature searches regarding SSC to improve patient safety have been widely used. However, from various literature studies, it is still limited to surgery and not much has been found about *Anesthesia Safety Checklist* (ASC). In Indonesia, the WHO SSC has been used, which has not been optimal in filling compliance due to various obstacles, resulting in an increase in medical errors every year. The combination of *Surgical and Anesthesia Safety Checklist* is expected to complement all existing limitations.

Based on the literature study, there are several barriers in implementing SSC, including human resource factors, environmental factors and patient factors. For this reason,

researchers are interested in developing a surgical and anaesthesia checklist model that can be practically implemented in surgical and anaesthesia service settings so that it is hoped that this development model can improve patient safety. The model to be developed will go through several stages, namely analysing the factors that influence the implementation of existing SSC, developing the model, conducting trials and implementation of the model and seeing the effect. The research design plan that will be used is RnD with 4 stages, namely identification of causal factors, developing a model, field trials and model implementation and analysing the effect of model implementation

References

1. D. Bainbridge, J. Martin, M. Arango, D. Cheng, Perioperative and anaesthetic-related mortality in developed and developing countries: A systematic review and meta-analysis. Lancet. **380**(9847), 1075–1081 (2012).
2. S. Degu, S. Kejela, H.T. Zeleke, Perioperative mortality of emergency and elective surgical patients in a low-income country: A single institution experience. Perioper. Med. **12**(1). (2023).
3. D.I. Chrisnawati, S. Sinaga, B. Saragih, Implementation of the surgical safety checklist in Central Surgical Unit of Santo Antonius Hospital Pontianak. Formosa J. Sci. Technol. **2**(10), 2705–2724 (2023).
4. A.S. Haugen, H.V. Wæhle, S.K. Almeland, S. Harthug, N. Sevdalis, G.E. Eide, et al., Causal analysis of World Health Organization's Surgical Safety Checklist implementation quality and impact on care processes and patient outcomes: Secondary analysis from a large stepped wedge cluster randomized controlled trial in Norway. Ann. Surg. **269**(2), 283–290. (2019).
5. A. Storesund, A.S. Haugen, H.V. Wæhle, R. Mahesparan, M.A. Boermeester, M.W. Nortvedt, et al., Validation of a Norwegian version of Surgical Patient Safety System (SURPASS) in combination with the World Health Organization's Surgical Safety Checklist (WHO SSC). BMJ Open Qual. **8**(1).(2019).
6. A. Storesund, A.S. Haugen, H. Flaatten, M.W. Nortvedt, G.E. Eide, M.A. Boermeester, et al., Clinical efficacy of combined Surgical Patient Safety System and the World Health Organization's Checklists in surgery: A nonrandomized clinical trial. JAMA Surg. **155**(7), 562–570. (2020).
7. G. Ramsay, A.B. Haynes, S.R. Lipsitz, I. Solsky, J. Leitch, A.A. Gawande, et al., Reducing surgical mortality in Scotland by use of the WHO Surgical Safety Checklist. Br. J. Surg. **106**(8), 1005–1011. (2019).
8. A. Chhabra, A. Singh, P. Kuka, H. Kaur, A. Kuka, H. Chahal, Role of perioperative surgical safety checklist in reducing morbidity and mortality among patients: An observational study. Niger. J. Surg. **25**(2), 192.(2019).
9. R.J.D. Guris, S.S. Duarte, C.R. Miller, A. Schiavi, S. Toy, Training novice anaesthesiology trainees to speak up for patient safety. Br. J. Anaesth. **122**, 710–713 (2019).
10. A. Tiruneh, T. Yetneberk, A three-year retrospective study of the World Health Organization Safety Checklist compliance in a comprehensive specialized hospital in Debre Tabor, North Central Ethiopia. Open Access Surg. **13**, 95–99 (2020).
11. M.D. Allene, Clinical audit on World Health Organization surgical safety checklist completion at Debre Berhan comprehensive specialized hospital: A prospective cohort study. Int. J. Surg. Open. **24**, 161–165 (2020).

12. A.J.R. De Bie, E. Mestrom, W. Compagner, S. Nan, L. van Genugten, K. Dellimore, et al., Intelligent checklists improve checklist compliance in the intensive care unit: A prospective before-and-after mixed-method study. Br. J. Anaesth. **126**(2), 404–414. (2021).
13. C.S.M. Correa, A. Bagatini, C.G. Prates, G.B. Sander, Patient safety in an endoscopy unit: An observational retrospective analysis of reported incidents. Braz. J. Anesthesiol. (Engl. Ed.) **71**(2), 137–141. (2021).
14. K. Harris, E. Søfteland, A.L. Moi, S. Harthug, A. Storesund, S. Jesuthasan, et al., Patients' and healthcare workers' recommendations for a surgical patient safety checklist: A qualitative study. BMC Health Serv. Res. **20**(1). (2020).
15. V. Röhsig, R.N. Maestri, M.F. Parrini Mutlaq, A. Brenner de Souza, A. Seabra, E.R. Farias, et al., Quality improvement strategy to enhance compliance with the World Health Organization Surgical Safety Checklist in a large hospital: Quality improvement study: Enhancing Surgical Safety Checklist compliance. Ann. Med. Surg. **55**, 19–23. (2020).
16. M.R. Moore, S.J. Mitchell, J.M. Weller, D. Cumin, J.F. Cheeseman, D.A. Devcich, et al., A retrospective audit of postoperative days alive and out of hospital, including before and after implementation of the WHO Surgical Safety Checklist. Anaesthesia **77**(2), 185–195. (2022).
17. F. Jaulin, Standardised handover process with checklist improves quality and safety of care in the postanaesthesia care unit: The Postanaesthesia Team Handover trial. Br. J. Anaesth. **127**(6), 962–970. (2021). https://doi.org/10.1016/j.bja.2021.08.010
18. D. Urban, B.K. Burian, K. Patel, N.W. Turley, M. Elam, A.G. MacRobie, et al., Surgical Teams' Attitudes about Surgical Safety and the Surgical Safety Checklist at 10 Years: A Multinational Survey. Ann. Surg. (2021).
19. F. Mihretu, The current state of anesthesia safety in a third world country: A cross-sectional survey among anesthesia providers in Ethiopia. Patient Saf. Surg. **15**(1). (2021).
20. M.K. Sibhatu, D.B. Taye, S.B. Gebreegziabher, E. Mesfin, H.M. Bashir, J. Varallo, Compliance with the World Health Organization's surgical safety checklist and related postoperative outcomes: A nationwide survey among 172 health facilities in Ethiopia. Patient Saf. Surg. **16**(1). (2022).
21. K. Harris, E. Søfteland, A.L. Moi, S. Harthug, M. Ravnøy, A. Storesund, et al., Development and validation of patients' surgical safety checklist. BMC Health Serv. Res. **22**(1). (2022).
22. M. Meersch, R. Weiss, M. Küllmar, L. Bergmann, A. Thompson, L. Griep, et al., Effect of intraoperative handovers of anesthesia care on mortality, readmission, or postoperative complications among adults: The HandiCAP Randomized Clinical Trial. JAMA **327**(24), 2403–2412. (2022).
23. J. Batista, E.D. de A. Cruz, D.P. da Silva, S.S. Nazário, B.C.S. Antunes, Impact of surgical checklists on the time of surgical processes: A cross-sectional study. Rev. Col. Bras. Cir. **50.** (2023).
24. S. Bozkurt, H. Tüzer, Patient safety in surgery: An investigation of the near-miss cases encountered by the surgical team while applying the Surgical Safety Checklist. Bezmialem Sci. **11**(1), 120–127. (2023).
25. F. Gul, M. Nazir, K. Abbas, A.A. Khan, D.S. Malick, H. Khan, et al., Surgical safety checklist compliance: The clinical audit. Ann. Med. Surg. **81**. (2022).

26. K. Harris, E. Søfteland, A.L. Moi, S. Harthug, M. Ravnøy, A. Storesund, et al., Feasibility of implementing a surgical patient safety checklist: Prospective cross-sectional evaluation. Pilot Feasibility Stud. **9**(1). (2023).
27. O.V. Ilorah, R. Harrichandparsad, M. Naidoo, Knowledge, attitudes, beliefs and practices of the WHO surgical checklist in neurosurgery at a quaternary referral hospital, Durban, South Africa. Interdiscip. Neurosurg. **36**. (2024).
28. T.D. Looke, S.C. Sonesh, A.M. Hughes, M.E. Gregory, J. Pepe, N.C. Hammer, et al., The pre-anesthesia induction patient safety (PIPS) checklist: Testing dynamic versus static implementation strategies. Hum. Factors Healthc. **5**. (2024).
29. K. Bielka, I. Kuchyn, M. Frank, I. Sirenko, U. Kashchii, A. Yurovich, et al., WHO Surgical Safety Checklist and Anesthesia Equipment Checklist efficacy in war-affected low-resource settings: A prospective two-arm multicenter study. Anaesthesiol. Intensive Ther. **55**(4), 291–296. (2023).
30. Bielka K, Kuchyn I, Frank M, Sirenko I, Kashchii U, Yurovich A, et al. WHO Surgical Safety Checklist and Anesthesia Equipment Checklist efficacy in war-affected low-resource settings: a prospective two-arm multicenter study. Anaesthesiol Intensive Ther. (2023)
31. M. Correa, A. Bagatini, G. Sander, Patient safety in an endoscopy unit: Reported incidents. Braz. J. Anesthesiol. **71**(2), 137–141. (2021).