HJOG An Obstetrics and Gynecology International Journal

Review

HJOG 2025, 24 (4), 281-290. | DOI: 10.33574/HJOG.0608

Adaptations of the WHO Surgical Safety Checklist in Cesarean Section: A Targeted Review of Existing Tools

Paraskevi Giaxi, Maria Dagla, Angeliki Sarella, Ermioni Palaska, Efstathia Alevizou, Kleanthi Gourounti

Department of Midwifery, University of West Attica, Greece

Correspondence
Paraskevi Giaxi, Agioy Spyridonos 28, 12243 Athens, email: parigiaxi@gmail.com

Abstract

Background: The Surgical Safety Checklist of the Worldwide Health Organization (WHO) comprises a vital tool in the improvement of the safety of patients throughout surgical procedures. Its implementation in cesarean sections, where the safety of the mother's health is equally critical to that of the neonates, still remains under research. The current study aims to achieve recognition, description and comparative analysis of tools which are based on or alter/adjust the WHO Surgical Safety Checklist, especially for use in cesarean section.

Methods: A focused review of the bibliography was conducted on three databases (PubMed, Embase, CINAHL, Scopus) and on the grey bibliography, up until May of 2025. Included were studies which described specialized safety checklists for cesarean sections. Three independent analysts executed the selection and the evaluation of these studies.

Results: 53 studies were acknowledged, out of which only three fulfilled the integration criteria. The lists originated from the United Kingdom, Africa and the United States of America, with adjustments in relation to the stages, the content and the implementation outline. Common elements included parameter assimilation of neonates as well as the increase of interdisciplinary communication.

Conclusion: The adaptation of the safety surgical checklist of the WHO in obstetric environmental care supports the safety of both the mother and the neonates, the standardization of procedures and the interdisciplinary collaboration. Despite the variation in the structure and the implementation of the tools, the existence of the specialized checklists for cesarean sections constitutes a significant step in the improvement of perinatal care. Further research is essential for the development of a uniformed, well-documented tool.

Keywords: Surgical safety, caesarean section, WHO Surgical Safety Checklist, perinatal care, quality improvement, maternal and neonatal safety

Introduction

A greatly significant endeavor worldwide, is the reduction of morbidity and mortality through the pursuit of the safe surgical methods. This is especially considered vital in Cesarean Section (CS), where the well-being of both the mother and the fetus/neonate is essential. CS involve a variety of medical experts having the ability to make crucial decisions immediately, through rapid escalation as well as teamwork on a daily basis [1]. Although it is among the routine procedures being performed nowadays, a cesarean birth includes several surgically intricate situations such as hemorrhaging, infections, and unfavorable anesthesia-related circumstances, especially in settings with scarce resources [2].

In reference to global surgical safety, the World Health Organization (WHO) forwarded the "Safe Surgery Saves Lives" initiative in 2008, introducing the Surgical Safety Checklist (SSC) as a basic implement to enhance communication, consistency, and teamwork during surgery [1,3]. The SSC aims to seize errors which can be avoided, improve documentation and encourage a common understanding among surgical team members. Three main stages of SSC are: pre-anesthesia, prior to skin incision and before the patient departs from the operating room [1]. From its implementation until now, the SSC has received extensive research and has been put into effect in a variety of surgical fields, with a number of studies showing notable reductions in perioperative complications or even deaths [4,5,6]. In relation to this, the SSC has proven to be effective in both high and low income countries as well as in low and middle income countries, where health systems are often limited in infrastructure and staff members. As a result, being able to adapt to such a wide range of resource levels has made the checklist become an essential procedural tool for developing cultures and an advantage to system levels [7]. Yet, putting the obstetric surgical setting into effect remains challenging.

There are vast differences in labor and delivery units in comparison to conventional operating theatres. Since cesarean deliveries can occur at any time, obstetric surgical teams often face a combination of both planned and emergency procedures which require quick transportation of teams from many fields [8]. In environments with such high levels of concentration, healthcare professionals must coordinate caring for more than one patient simultaneously—for instance a mother and her neonate—while at the same time fulfilling other demands in the maternity unit. These factors tend to make the flow of surgical procedures very complex, and hard to enforce. Moreover, all healthcare professionals view and use the checklist quite differently, especially in obstetric circumstances, where time is critical [9,10].

Even though the implementation and effectiveness of the Surgical Safety Checklist (SSC) in general surgeries has been extensively studied, its application in CS remains limited. The aim of the present study is to identify, describe, and compare tools or modifications of the WHO Surgical Safety Checklist specifically designed for use in obstetric cases. This study seeks to identify best practices for implementing a checklist that maximizes the safety of the mother–fetus/neonate dyad and to provide evidence-based recommendations to health policy makers with the goal of enhancing perinatal safety and quality of care globally.

Materials and Methods

Search Strategy

A targeted literature review was conducted and study selection is presented in Figure 1. The following databases were used to search for the understandable writings: PubMed/MEDLINE, Embase, CINAHL, Scopus and grey literature. All reviews were published from the initial database up until May 2025. Among the search terms and combinations used were: "Surgical

Safety Checklist", "WHO Surgical Safety Checklist", "obstetric surgery", "cesarean section", and "implementation" "adoption", "compliance", "tools". Reference lists of both the studies involved as well as the relevant reviews were also manually screened to identify additional eligible publications. All titles and abstracts were independently screened by three reviewers. Full texts of eligible studies were obtained and analyzed to be included. The second and the last reviewers resolved any differences which arose between the reviewers by discussing or consulting.

Eligibility Criteria

Research compatible with the following factors could be comprised. These include checklists that have been designed or adapted for use in cesarean sections as well as studies that clearly and adequately describe the tool in sufficient detail. Exclusion criteria included studies that involved the use of a surgical safety checklist, without specific reference to cesarean sections. Also excluded were abstracts, commentaries, reviews, or non-English reports without full-text availability.

Data Extraction

Data was retrieved using a pre-defined template. Derivation variables included: name and source of the tool, the year of publication, country or organization responsible for the development of the tool, brief description of the tool, correlation with the WHO safety checklist, documentation of implementation.

Results

From the initial search, 53 publications were identified. Their titles and abstracts were reviewed for relevance to the purpose of the present study. Subsequently, 43 studies were excluded, and 10 were selected for full-text review based on title and abstract. Ultimately, three studies met the inclusion criteria and described customized surgical safety checklists for use during CS, based on the WHO Surgical Safety Checklist (Table 1). The excluded studies were dismissed for the following reasons: they did not include checklists tailored to obstetric cases, were not written in English or the full text was not available.

In 2012, the National Patient Safety Agency (NPSA), which was responsible for patient safety in the NHS in the UK until it was integrated into NHS Improvement, adapted the WHO Surgical Safety Checklist for obstetric cases, and its implementation was officially adopted across all Caesarean sections in the United Kingdom [11]. The checklist includes three stages, as in the original WHO version (sign in, time out, and sign out), with additional safety criteria for the mother and the fetus/neonate. More specifically, in the "sign in" stage, a system for grading the urgency of the CS (score 1 to 4) was added. Additionally, confirmation of the call to the neonatal team was introduced. During the "time out" stage, the checklist was enriched with the names of the team members present during the CS, namely obstetricians and midwives, and the specific roles they have. Specifically, the obstetrician confirms: what additional procedure(s) are planned, if there are any critical or unusual steps the team should be aware of and whether there are any concerns about the placenta site. Also, the midwives confirm: whether blood samples are needed, whether the urinary catheter is draining properly, whether the Fetal Scalp Electrode (FSE) has been removed and whether VTE prophylaxis has been undertaken. In the checklist developed by the National Patient Safety Agency, the third stage, "sign out", includes critical points aimed at enhancing the safety of both mother and neonate. Specifically, it begins with confirmation of the documentation of blood loss during the procedure. Then, the Obstetrician, Anesthetist, and Midwife confirm whether key concerns for recovery and ongoing management have been discussed, whether post-operative VTE prophylaxis has been prescribed and whether any antibiotics have been administered. Finally, in this checklist, a field was added for

Table 1. Main findings of included studies

Author/Year	Country	Checklist categorization	Additional criteria compared to WHO CCS
National Patient Safety Agency (2010) [11]	The United Kingdom	Sign in/ Time out/ Sign out (3 stages)	Sign in: cesarean section category (1-4), neonatal team activation). Time out: role – specific task confirmation (e.g. concerns about placenta site, catheter draining, fetal scalp electrode removal, VTE prophylaxis. Sign out: documentation of blood loss, high alert medicines (e.g. VTE prophylaxis, antibiotics), neonate identification, cord blood and gas documentation, and recovery team communication responsibilities.
Sun et al. (2020) [12]	Africa	Prior to starting surgery/ After completion of surgery (2 stages)	Prior to starting: indication of CS, fetal presentation, placentation, risk of maternal hemorrhage, bladder foley, safety belt on women's leg, maternal positioning (left lateral). After completion of surgery: documentation of estimated blood loss and complications, postoperative care planning.
SMFM (2021) [13]	USA	Briefing/ Time-Out/ Debriefing (3 stages)	Briefing: activation of the NICU team, (if required), review of the most recent laboratory results, documentation of existing medical or obstetric issues, assessment of risk for postpartum hemorrhage (PPH), evaluation by the anesthesiologist. Time-out: initiated by the primary surgeon, verbal confirmation of patient details by the patient, announcement of additional procedures, confirmation by the midwives regarding implementation of Sequential Compression Devices (SCDs), risk of postpartum hemorrhaging (PPH), blood products, and briefing the neonate care provider." Debriefing: documentation of blood loss, specimen to be sent for histopathology, documentation of cord blood and cord gas and detailed plan outlining recovery team communication responsibilities.

SSC: Surgical Safety Checklist; VTE: Venous Thromboembolism; NICU: Neonatal Intensive Care Unit.

the midwife to confirm that the neonate has been properly identified and identification bracelets have been placed accordingly on the neonate(s). Additional fields are also included to confirm whether relevant cord bloods have been taken and whether cord gases have been recorded (if required) [11].

The second study identified describes the development and implementation of a modified version of the WHO Surgical Safety Checklist for cesarean section, adapted for low-resource settings. Specifically, it was developed and implemented in a public hospital in Rwanda, Africa [12]. The structure of the tool includes two parts: before the surgical incision and after the completion of the procedure. The first part was completed before the uterine incision (before skin incision) by the nurse/midwife, and the second part after the completion of the cesarean section by the surgeon. The first stage of the checklist includes critical items such as the identification of the parturient, presence of allergies, preoperative administration of antibiotics, placement of a bladder catheter (bladder Foley), assessment of risk factors for hemorrhaging during delivery, the indication for cesarean section (indication for CS), fetal presentation, placental location (placenta), positioning of the parturient in the left lateral position (left lateral dis-

placement), and antisepsis at the incision site. The second part of the checklist includes documentation of correct instrument and sponge counts, documentation of blood loss, planning of postoperative care in that case and recording of any intraoperative complications that may have occurred [12].

In 2021, the Society for Maternal-Fetal Medicine (SMFM) developed four proposed surgery safety checklists for cesarean delivery, which include safety criteria for both the mother and the neonate [13]. These checklists are based on the WHO Surgical Safety Checklist (SSC). The core checklist was developed in two formats (question–answer format and brief format), incorporating all the criteria included in the WHO SSC and enhanced with highly critical factors concerning both the mother–fetus/neonate dyad, as well as a more precise definition of the core safety criteria established by WHO. Specifically, the checklist is structured into three distinct phases: briefing, time-out, and debriefing. The Briefing Phase takes place before entering the operating room and focuses on team preparation and verification of critical information regarding the patient and the procedure. It includes patient identification and informed consent, information on patient allergies, readiness of critical equipment, confirmation of the presence of key medical specialties, anesthesia evaluation and necessary interventions, assessment of risk for Postpartum Hemorrhage (PPH), availability of blood or blood products, notification of the NICU

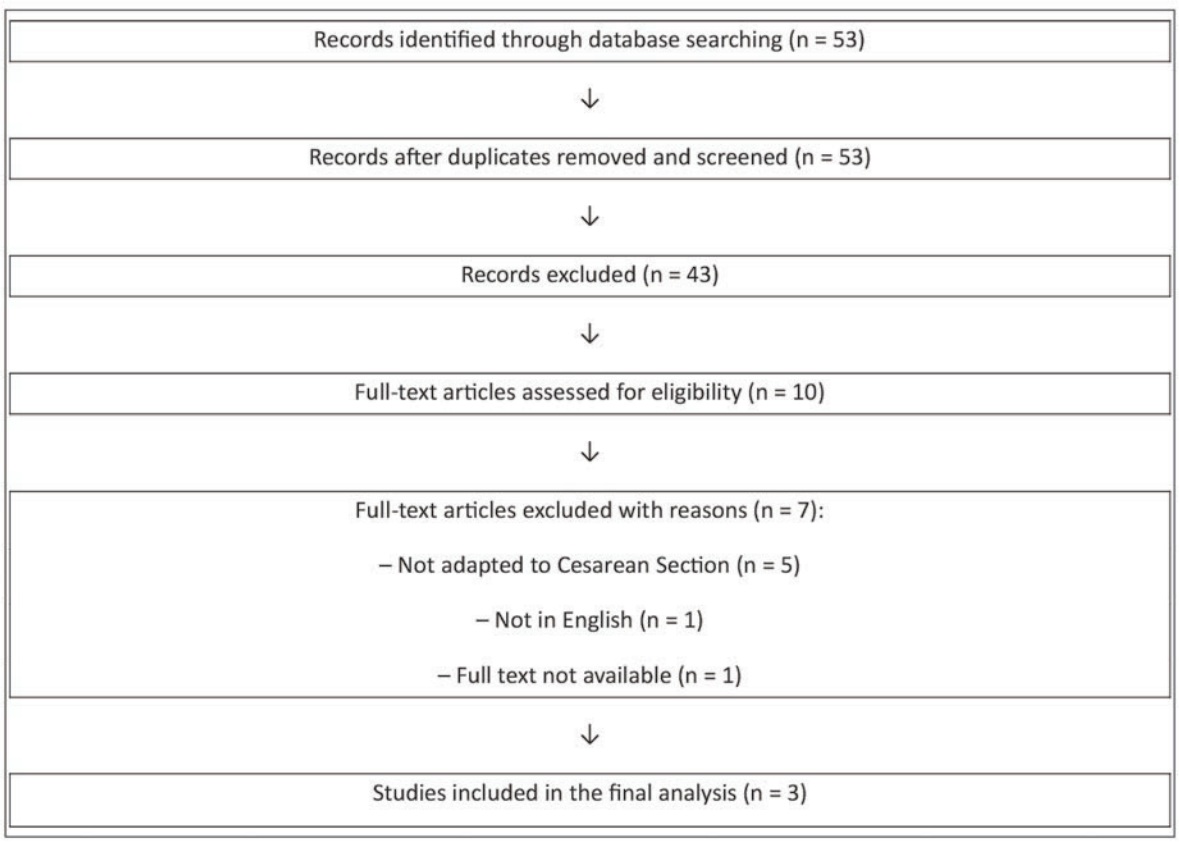

Figure 1. Study selection flowchart

if required and administration of prophylactic antibiotics. The Time-out Phase occurs just before the incision and focuses on shared decision-making and coordination among the surgical team. It begins at the initiative of the lead surgeon and aims to ensure all team members are aligned with the care plan before the cesarean section begins. Key elements include a request for a NICU healthcare provider to be present, as the patient states her full name, date of birth, and the scheduled surgical procedure, which is verified against the medical record and identification bracelet. The surgeon lists all planned procedures (e.g., tubal ligation, umbilical cord blood collection). The anesthesiologist informs the team about the type and timing of prophylactic antibiotic administration, the postoperative analgesia plan and the use of active temperature maintenance methods. The obstetric team confirms proper application of Sequential Compression devices (SCDs), current hemorrhage risk assessment (PPH), the availability of blood products and equipment readiness. The brief neonate provider is informed about gestational age, estimated fetal weight, the indication for cesarean delivery, key pregnancy characteristics and medications administered. The time-out process is completed once it is confirmed that there are no additional concerns and all team members consent to begin the procedure. The Debriefing Phase occurs immediately after the cesarean delivery is completed, before the surgical team leaves the room. It is a short but crucial step focused on reviewing the procedure, documenting key parameters and preparing for postoperative care of both the mother and the neonate.

Initially, the results of the counts of gauzes, sharp objects, and surgical instruments are announced. The lead surgeon states the procedure that was performed and the corresponding indication, while a decision is made regarding whether umbilical cord blood gases will be sent. At the same time, the thromboprophylaxis checklist is completed, and if necessary, the initiation of anticoagulant therapy is planned. Specific postoperative medical instructions are also recorded, such as the continuation of magnesium for preeclampsia, treatment for hypertension, prevention of Postpartum Hemorrhage (PPH), care for diabetes mellitus, or the need for antibiotics or urinary catheter placement. It is discussed whether the placenta or other surgical specimens (e.g., fallopian tubes) will be sent for histopathological examination. The surgical, anesthetic, and obstetric teams discuss pain management, estimate total blood loss, assess the amount of fluids administered, and monitor urine output. Any equipment problems or delays are also documented, and a responsible person is designated for tracking and documenting these issues. If the patient is alert, she is given the opportunity—along with her partner if present—to ask questions or express concerns. Finally, the anesthesiologist confirms that all medications are correctly stored and that unused drugs have been safely discarded. This debriefing incorporates elements of procedural verification, interdepartmental communication, and incident documentation, reinforcing the continuity and quality of postoperative care [13].

Although, as the authors note, the study is not accompanied by implementation data, it stands out for the clarity of its structure and the incorporation of critical parameters aimed at ensuring the safety of women and neonates. Within the same study, a checklist form was developed for preparation in the waiting area prior to transfer to the operating room. It is intended to be completed individually by the midwife, without the participation of the entire team. It includes, in an organized manner, all the elements that are often documented in separate locations (paper forms, EHRs, apps, cardiotocographs), gathered on a single page. It covers: clinical preparation, such as laboratory tests, line placement, skin anti-

sepsis, precautions, fetal monitoring, and medication administration. Administrative documentation, including the prenatal file, consents, medical history, admission form and the patient's personal belongings. Medical confirmation with the obstetrician, such as lab interpretation, blood availability, placental position, type of incision, antibiotic coverage, and any special concerns. Additionally, the same study developed a coordination checklist for emergency cesarean sections. It is to be filled out in real time, aiming to ensure clear communication, proper documentation of decision-making, and enhanced preparedness. The form includes the indication for an emergency cesarean, assurance of effective notification of the anesthesiologist and NICU staff, criteria such as confirmation of the availability of blood, medications, and equipment, documentation of team response and timing. This checklist serves as a tool for intra-team activation, reducing response time and avoiding confusion or delays—especially in units with a high volume of emergency cases [13].

Discussion

The three checklists based on the WHO Surgical Safety Checklist and presented in this study incorporate specialized criteria that reflect the needs of obstetric care [11,12,13]. The addition of criteria concerning the neonate is a common feature in the adapted checklists, acknowledging the dual nature of safety (for both mother and neonate). The adaptation of the WHO Surgical Safety Checklist by Sun et al. [12] in a public hospital in Rwanda (Africa) demonstrates that even simple interventions can enhance safety in low-income settings. Moreover, the tool's effectiveness is reinforced by improvements in perinatal safety indicators (e.g., reduced hospital stays longer than four days, improved compliance with antibiotic administration). The tool is easy to implement as it requires no specialized technological infrastructure or additional resources and is adaptable to the skills of the local team [12]. However, the tool shows several deviations from the original WHO structure, even in basic categorization. Instead of the three primary WHO categories—sign in, time out, sign out—it is divided into two main groups of questions (prior to starting surgery and after completion of surgery). Additionally, as the study notes, the results come from a single hospital in Africa, limiting the generalizability of the findings to other settings or populations.

The adoption of a modified WHO Surgical Safety Checklist by the UK's National Patient Safety Agency (NPSA) specifically for CS, represents a unique case of systematic and nationally-led integration of a specialized safety tool [11]. The decision to mandate its use across all NHS units performing CSs fundamentally differentiates its implementation framework from other countries or organizations where such tools are used locally, as pilot programs, or on a voluntary basis. In a study conducted in UK [14], it was shown that applying a WHO surgical safety checklist in CS improves communication about the urgency level of CS between obstetricians and anesthesiologists. This study provides rare documentation in an often-overlooked area: the qualitative dimension of interdepartmental communication as a pillar of safety. Since most research focuses on hard clinical outcomes (e.g., infections, hemorrhage), this study enriches the literature by adding insights into team functionality and dynamics. It also reinforces the notion that the WHO Surgical Safety Checklist is not just a compliance tool but a mechanism for cultural change, promoting equal participation of all healthcare professionals in maternal care [14].

The SMFM checklist [13] is characterized by a multi-layered approach and detailed documentation, suited for settings with well-developed infrastructures. It includes examples of standard surgical safety checklists for CS that cover both maternal and

neonatal care. It also offers an alternative checklist for emergency cesarean deliveries, where there is not enough time for the standard checklist to be fully executed, and a preoperative checklist sample for use before transferring the woman to the operating room. It is the most recently published safety checklist for CSs. Its structure aligns with the basic WHO format, and even previously existing WHO criteria have been rephrased to ensure effective implementation. The debriefing stage includes the possibility for active participation by the mother and, where permitted, her partner. This supports person-centered care and acknowledges the importance of information and consent even in the immediate postoperative phase. Unfortunately, no implementation studies were found, so its effectiveness in reducing adverse events remains theoretical.

There is no consensus on a universally accepted, internationally applicable checklist tool for CS. Existing examples vary in structure, depth, and practicality. The positive impact of the basic WHO Surgical Safety Checklist on perinatal safety indicators has been documented in earlier studies. In a study conducted in Scotland over 14 years, use of the standard checklist was associated with a 36.6% reduction in maternal mortality following CS [15]. Similarly, another study in Ethiopia found that not using the WHO SSC was associated with increased 7-day perioperative mortality in women post-cesarean [16]. Given the effectiveness of the basic checklist in improving perinatal indicators, it is expected that implementing an obstetric-specific checklist with additional criteria will further enhance perinatal safety. Further research in this field is needed.

In any case, how a healthcare unit adopts a surgical safety checklist is of utmost importance. Studies linking checklist implementation with improved morbidity and mortality indicators have typically included extensive programs involving staff engagement and training [17, 18, 19]. In contrast, a Canadian study concerning a province-wide government mandate to document checklist use failed to show any benefit [20]. Previous research has emphasized that the effectiveness of checklists "depends on the ability of implementation leaders to convincingly explain why and to show adaptively how to use the checklists" [21]. A recent review concluded that implementing a surgical safety checklist is “a complex and difficult process requiring effective leadership, clear responsibility allocation among professionals, team collaboration, and institutional support” [22]. The importance of clinical governance and active physician involvement has been shown to be effective at all levels [23].

For a healthcare unit, the first step in implementing a surgical safety checklist for CS is to form a stakeholder group. This group should include clinical doctors, obstetricians, neonatologists, anesthesiologists, midwives, other relevant surgical staff, and a hospital administrator. Additionally, an IT representative should be included if the team wishes to integrate any of the checklists into the Electronic Health Record. In university hospitals, residents and fellows should also be included. Including a patient advocate may help the team better understand the perspective of the patient. The next step is selecting which safety checklist to use. At this point, the present study is particularly useful in understanding the specific differences between available tools. The chosen format should aim to strike a balance between completeness and usability as has been reported by previous studies [15].

Conclusions

The adaptation of checklists for cesarean sections, modeled after the WHO Surgical Safety Checklist, underscores the significance to adjust safety protocols to suit the unique demands of obstetric care. The limited existing studies suggest that these tools help en-

hance communication among healthcare teams, ensure consistency in performing critical safety checks, and may reduce perinatal risks. Although there are variations in their design, complexity, and use, it is evident that including specific guidelines for both maternal and neonatal care is essential for achieving safer and more coordinated practices. There remains an urgent need for the creation, validation, and global implementation of a standardized, evidence-based cesarean checklist in order to support better outcomes and reduce preventable errors in obstetrics.

Disclosure of conflicts of interest

The authors report no conflicts of interest.

Funding

No funding.

References

1. World Health Organization. Safe surgery saves lives: The surgical safety checklist [Internet]. Geneva: World Health Organization; 2008. Available from: https://www.who.int/teams/integrated-health-services/patient-safety/research/safe-surgery/tool-and-resources [cited 2025 Jul 10].
2. Betrán AP, Ye J, Moller AB, Zhang J, Gülmezoglu AM, Torloni MR. The Increasing Trend in Caesarean Section Rates: Global, Regional and National Estimates: 1990-2014. PLoS One. 2016 Feb 5;11(2):e0148343. doi: 10.1371/journal.pone.0148343.
3. Haynes AB, Weiser TG, Berry WR, Lipsitz SR, Breizat AH, Dellinger EP, Herbosa T, Joseph S, Kibatala PL, Lapitan MC, Merry AF, Moorthy K, Reznick RK, Taylor B, Gawande AA; Safe Surgery Saves Lives Study Group. A surgical safety checklist to reduce morbidity and mortality in a global population. N Engl J Med. 2009 Jan 29;360(5):491-9. doi: 10.1056/NEJMsa0810119.
4. Weiser TG, Haynes AB, Dziekan G, Berry WR, Lipsitz SR, Gawande AA; Safe Surgery Saves Lives Investigators and Study Group. Effect of a 19-item surgical safety checklist during urgent operations in a global patient population. Ann Surg. 2010 May;251(5):976-80. doi: 10.1097/SLA.0b013e3181d970e3.
5. Patel VJ, Napolitano PG, Hemman EA, Nielsen PE, Deering S. Adaptation of the World Health Organization (WHO) Safe Surgery Checklist for Use With Cesarean Sections: Implementation and Outcomes With the Safe Cesarean Section Checklist. Cureus. 2024 May 29;16(5):e61330. doi: 10.7759/cureus.61330.
6. Dirie NI, Elmi AH, Ahmed AM, Ahmed MM, Omar MA, Hassan MM, Abdi AO. Implementation of the WHO surgical safety checklist in resource-limited Somalia: a new standard in surgical safety. Patient Saf Surg. 2024 Oct 14;18(1):30. doi: 10.1186/s13037-024-00410-2.
7. Patient Safety Network. Never events [Internet]. Agency for Healthcare Research and Quality. Available from: https://psnet.ahrq.gov/primer/never-events. Accessed 01 May 2025.
8. Arora KS, Shields LE, Grobman WA. Communication failures in obstetric care: A critical review. Obstet Gynecol. 2018;131(6):1031–8. doi. 10.1097/AOG.0000000000002610
9. Weller J, Boyd M, Cumin D. Teams, tribes and patient safety: overcoming barriers to effective teamwork in healthcare. Postgrad Med J. 2014 Mar;90(1061):149-54. doi: 10.1136/postgradmedj-2012-131168.
10. Amrita A, Kumari J, Sinha A, Singh A, Goel N, Poonam P, Hussain M. Role of the WHO Surgical Safety Checklist in Reducing Morbidity and Mortality Among Obstetrics and Gynecology

Patients Undergoing Surgery: A Prospective Comparative Study. Cureus. 2024 May 21;16(5):e60775. doi: 10.7759/cureus.60775.

11. National Patient Safety Agency. WHO safe surgery checklist: for maternity cases only. [www.nrld.npsa.nhs.uk/resources/type/guidamce/?entryid45=83972]. Accessed 01 May 2025.
12. Sun M, Patauli D, Bernstein PS, Goffman D, Nathan LM. Use of a cesarean delivery checklist in an African maternity ward to improve management and reduce length of hospital stay†. Int J Gynaecol Obstet. 2021 Feb;152(2):236-241. doi: 10.1002/ijgo.13355.
13. The Society for Maternal-Fetal Medicine Special Statement: Surgical safety checklists for cesarean delivery. Available from: smfm@smfm.org. Accessed 15 June 2025.
14. Mohammed A, Wu J, Biggs T, Ofili-Yebovi D, Cox M, Pacquette S, Duffy S. Does use of a World Health Organization obstetric safe surgery checklist improve communication between obstetricians and anaesthetists? A retrospective study of 389 caesarean sections. BJOG. 2013 Apr;120(5):644-8. doi: 10.1111/1471-0528.12041. Epub 2012 Nov 27.
15. Ramsay G, Haynes AB, Lipsitz SR, Solsky I, Leitch J, Gawande AA, Kumar M. Reducing surgical mortality in Scotland by use of the WHO Surgical Safety Checklist. Br J Surg. 2019 Jul;106(8):1005-1011. doi: 10.1002/bjs.11151. Epub 2019 Apr 16.
16. Endeshaw AS, Asress EM, Bayu HT, Andargie DG, Molla MT, Dejen ET, Kumie FT. Perioperative mortality of caesarean section in North-West Ethiopia: a prospective cohort study. BMJ Open. 2024 Oct 21;14(10):e087598. doi: 10.1136/bmjopen-2024-087598.
17. Haynes AB, Weiser TG, Berry WR, Lipsitz SR, Breizat AH, Dellinger EP, Herbosa T, Joseph S, Kibatala PL, Lapitan MC, Merry AF, Moorthy K, Reznick RK, Taylor B, Gawande AA; Safe Surgery Saves Lives Study Group. A surgical safety checklist to reduce morbidity and mortality in a global population. N Engl J Med. 2009 Jan 29;360 (5):491-9. doi: 10.1056/NEJMsa0810119.
18. de Vries EN, Prins HA, Crolla RM, den Outer AJ, van Andel G, van Helden SH, Schlack WS, van Putten MA, Gouma DJ, Dijkgraaf MG, Smorenburg SM, Boermeester MA; SURPASS Collaborative Group. Effect of a comprehensive surgical safety system on patient outcomes. N Engl J Med. 2010 Nov 11;363(20):1928-37. doi: 10.1056/NEJMsa0911535.
19. Dinesh HN, Ravya RS, Kumar S. Surgical safety checklist implementation and its impact on patient safety. Int Surg J 2018;5:3640–3.
20. Urbach DR, Govindarajan A, Saskin R, Wilton AS, Baxter NN. Introduction of surgical safety checklists in Ontario, Canada. N Engl J Med. 2014 Mar 13;370(11):1029-38. doi: 10.1056/NEJMsa1308261.
21. Conley DM, Singer SJ, Edmondson L, Berry WR, Gawande AA. Effective surgical safety checklist implementation. J Am Coll Surg. 2011 May;212 (5):873-9. doi: 10.1016/j.jamcollsurg.2011. 01.052.
22. Tostes MFP, Galvão CM. Implementation process of the surgical safety checklist: integrative review. Rev Lat Am Enfermagem 2019;27: e3104.
23. Gillespie BM, Marshall A. Implementation of safety checklists in surgery: a realist synthesis of evidence. Implement Sci. 2015 Sep 28;10: 137. doi: 10.1186/s13012-015-0319-9.

Received 19-7-2025
Revised 8-8-2025
Accepted 10-8-2025