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Adherence to Surgical Safety Checklist of a Level II Private Hospital in Sorsogon City

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ABSTRACT

Patient safety remains a fundamental priority in healthcare, particularly in surgical settings where preventable adverse events continue to pose significant risks. Globally, millions of surgical procedures are performed annually, with a substantial proportion of complications and mortality attributed to lapses in safety standards. This study evaluates adherence to the WHO Surgical Safety Standards of a Level II private hospital in Sorsogon City, focusing on key safety domains including patient verification, infection control, anesthesia safety, equipment management, and multidisciplinary team communication. The study is anchored on three theoretical foundations: the Theory of Planned Behavior by Icek Ajzen, Human Factors Theory, and Donabedian's Structure–Process–Outcome Model. The study utilized a quantitative research design to assess adherence to the WHO Surgical Safety Standards in a Level II private Hospital in Sorsogon City. This approach measures the level of adherence, identify existing gaps, and propose measures to improve checklist implementation. Data were collected using a researcher-developed questionnaire based on the WHO Surgical Safety Checklist, employing a five-point Likert scale to assess adherence during the three critical phases of surgery: sign-in, time-out, and sign-out. A ranking scale was also used to prioritize perceived gaps in adherence. Total enumeration was applied, involving all 37 eligible operating room personnel, including nurses, nursing attendants, surgeons, pediatricians, and anesthesiologists, all with at least six months of hospital experience. The results showed a consistently very high level of adherence to the WHO Surgical. The study concludes that adherence to the WHO Surgical Safety Standards in the Level II private Hospital in Sorsogon City is consistently very high across all phases of surgical care—sign-in, time-out, and sign-out. However, minor gaps persist in communication-dependent components, particularly in discussing procedural risks and intraoperative concerns, indicating that high compliance does not always equate to optimal checklist execution.

Keywords: *Adherence, Surgical safety standards, Level II private Hospital*

INTRODUCTION

Ensuring patient safety is a fundamental aspect of healthcare, with nurses playing a crucial role by adhering to safety protocols that prevent harm. Surgical safety in the operating room has become a global priority in modern health care, driven by the growing recognition that surgical interventions while lifesaving carry significant risks when safety standards are not consistently applied. The World Health Organization (WHO) estimates that around 234 million surgical operations are carried out globally each year, making surgery among the most frequently performed medical interventions. However, surgical complications

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account for a significant proportion of preventable morbidity and mortality, particularly in low- and middle-income countries where resources may be limited. World Health Organization. (2024).

Globally, about 45% of medical errors take place in the operating room, and almost half of these incidents can be prevented. Given the clear evidence of avoidable patient harm, both professional attitudes and clinical practices must evolve to support safer care. Five (5) Steps to Safer Surgery is a surgical safety checklist (SSC) designed for this purpose. It includes five stages, these are briefing, sign-in, time-out, sign-out, and debriefing. The National Patient Safety Agency (NPSA) recommends its use for every patient undergoing surgery in England and Wales. In healthcare, maintaining patient safety during surgical procedures is of utmost importance. Surgical safety checklists (SSC) are now widely recognized as essential tools for improving safety standards and reducing risks linked to surgical interventions. These checklists help create consistency in procedures, strengthen team communication, and minimize mistakes that may compromise patient wellbeing.

IPSG most commonly refers to the International Patient Safety Goals, a set of standards developed by Joint Commission International (JCI) to improve patient safety in healthcare organizations worldwide. These goals focus on critical areas of care, such as correctly identifying patients, improving communication between caregivers, using medications safely, performing correct surgeries, reducing hospital-acquired infections, and preventing patient falls. This study specifically focused on the goal number four which is the "Ensure patient surgery". The objective of this goal is to eliminate surgical errors such as performing surgery on the wrong patient, wrong site, or wrong procedure. It promotes team communication and shared accountability in the operating room and reinforces patient safety culture through adherence to the WHO Surgical Safety Checklist (SSC).

According to the WHO, use of the Surgical Safety Checklist (SSC) has led to a reduction of more than 30% in surgical complications and deaths. The checklist can be completed by any surgical team in less than two minutes. It was created to be cost-effective and practical, allowing surgical teams in low and middle-income countries to implement it with ease. Since its introduction in 2008, the WHO Surgical Safety Checklist has provided a systematic method to enhance communication within surgical teams.

Best practices in the operating room (OR) now emphasize a multidisciplinary approach involving surgeons, anesthesiologists, nurses, and allied health professionals. These practices include strict adherence to SSC, infection prevention protocols, accurate surgical counts, patient-centered communication, and the use of evidence-based perioperative guidelines. Furthermore, simulation training and continuous professional development have emerged as key strategies for improving teamwork and clinical decision-making under pressure. A systematic review found that hospitals do not consistently provide safe care, as adverse events affected 9.2% of patients. Of these events, about 43.5% were considered preventable, while approximately 1 in every 150 patients died from complications linked to medical treatment. The majority of these incidents were connected to surgical care, accounting for 39.6%, whereas 15.1% were associated with medication-related problems.

Evaluating surgical safety checklist in the OR is therefore critical to identifying strengths, gaps, and opportunities for improvement. By examining adherence to surgical safety standards, covering infection control, patient verification, equipment management, anesthesia safety, and team communication. This study aimed to evaluate the adherence to surgical safety standard of a Level II Hospital in Sorsogon City.

This study is anchored on administrative order no. 2008-0823 is an order issued by the Department of Health (DOH) that focuses on implementing patient safety practices in healthcare facilities, particularly the use of the WHO Surgical Safety Standards. The policy aims to reduce medical errors and improve the safety of patients in healthcare settings such as hospitals, clinics, and other health facilities.

AO 2008-0023 provides the national policy foundation for patient safety initiatives in Philippine healthcare facilities, supporting the implementation of safety tools such as the standard WHO Surgical Safety Checklist (SSC) to minimize surgical complications and enhance patient outcomes. AO 2008-0023

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emphasizes strict adherence to safety protocols, team communication during surgery, accurate patient identification and prevention of surgical errors.

The Department of Health (DOH) Administrative Order No. 2020-0007, titled National Policy on Patient Safety, serves as the primary framework for implementing patient safety programs in all health institutions. AO 2020-0007 modernized the Philippines' approach to patient safety by aligning national standards with international best practices, particularly the WHO's "Safe Surgery Saves Lives" initiative. It ensures that every surgical procedure in the country follows standardized safety steps to reduce morbidity, mortality, and surgical complications.

This order mandates the use of the World Health Organization (WHO) Surgical Safety Checklist (SSC) and identifies "Safe Surgery" as a core patient safety area, requiring strict adherence to protocols for correct patient identification, surgical site verification, time-out procedures, and postoperative safety practices. Collectively, these legal instruments guide healthcare institutions and surgical teams in ensuring that surgical procedures are performed safely, effectively, and in compliance with national and international standards.

Current State of Research in the Field

A significant association was found between post-operative safety practices and maintaining updated membership in the Operating Room Nurses Association of the Philippines (ORNAP). Operating room nurses are encouraged to pursue postgraduate education and attend relevant seminars and training programs to remain informed about current trends and developments in OR nursing. They should also continue strengthening their patient safety practices to support better recovery outcomes for surgical patients. In addition, maintaining active membership in ORNAP is essential for keeping up with advancements in the field. The proposed enhanced surgical safety checklist should likewise be recommended for adoption in different hospitals to help preserve favorable outcomes for patients undergoing surgery (Merillana, 2024).

Furthermore, the study determined the level of compliance with surgical safety practices among operating room nurses from provincial-run hospitals in Negros Occidental that the nurses' compliance with the SSC is favorable and that their level of compliance is not related or associated with sex, age, work experience, and highest educational attainment. Moreover, it is recommended that interventions/strategies such as regular assessment/re-assessment of performance, relevant training, higher educational pursuits and research, and benchmarking be implemented to improve and maintain the nurses' level of compliance. Dugayo, N. J., & Condes, K. (2025).

Synthesis of the Art

The World Health Organization (WHO) Surgical Safety Checklist (SSC) is widely recognized as a major patient safety intervention in perioperative care. Developed to lessen preventable harm during surgical procedures, the checklist provides a structured approach that promotes consistency, teamwork, and communication across the surgical pathway. The checklist is organized into five phases: briefing, sign-in, time-out, sign-out, and debriefing." (slightly reworded for flow; the names of the stages are standard). As described in Introduction to the WHO Surgical Safety Checklist – 5 Steps (2022), the SSC was designed not only to standardize safety practices but also to strengthen communication among healthcare professionals involved in surgery. WHO data indicate that employing the checklist can decrease surgical complications and deaths by over 30%, highlighting its practicality, affordability, and suitability for resource-limited environments (Introduction to the WHO Surgical Safety Checklist – 5 Steps, 2022).

Each component of the checklist addresses a critical point of vulnerability in surgical care. The briefing phase is intended to ensure that team members understand the operating schedule, their individual responsibilities, and any concerns relevant to the planned procedures. Sign-in verifies key patient and procedural information before anesthesia is administered, including identity, surgical site, consent, allergies, airway concerns, and possible blood loss. Time-out occurs immediately before incision and requires the

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whole team to pause and confirms the correct patient, correct site, correct procedure, and readiness for any anticipated critical event. Sign-out focuses on confirming completion of the procedure, specimen labeling, instrument and sponge counts, and recovery concerns, while debriefing encourages reflection, shared learning, and discussion of areas for improvement (Introduction to the WHO Surgical Safety Checklist – 5 Steps, 2022). Collectively, these steps make the SSC more than a simple checklist; they position it as a communication-based framework for safe surgical practice.

SSC principles align with International Patient Safety Goal 4, focusing on avoiding errors such as surgery on the wrong patient, site, or procedure. Through pre-procedure verification, surgical site marking, and the formal time-out process, the checklist reinforces accuracy, team accountability, and shared situational awareness in the operating room. These elements are essential in preventing serious surgical errors and in cultivating a stronger safety culture among perioperative teams.

Current evidence continues to support the importance of the SSC in improving perioperative outcomes. Reviews have shown that effective checklist implementation contributes to better communication, stronger teamwork, increased compliance with safety measures, and lower rates of surgical complications and deaths (Alsadoun et al., 2024; Haugen, 2019). A prospective multicenter study conducted across eight pilot hospitals in Toronto, New Delhi, Amman, Auckland, Manila, Ifakara, London, and Seattle found that following implementation of the WHO SSC, inpatient complications decreased from 11.0% to 7.0%, while in-hospital mortality declined from 1.5% to 0.8%, reflecting a substantial reduction in combined surgical risk (Tool and Resources, 2025). These findings demonstrate the checklist's broad relevance across different healthcare systems and reinforce its role as an internationally applicable patient safety strategy.

Together, these steps transform the SSC from a basic checklist into a structured communication framework that supports safe surgical practice. The SSC is most successful in improving the specific domains it was designed to address, such as communication, verification, and adherence to critical perioperative safety steps. However, it does not independently resolve broader system-level challenges such as workforce shortages, variable surgical skill, poor hospital management, or gaps in postoperative care (Sotto et al., 2021). This suggests that while the SSC is an essential instrument for safer surgery, its full impact is best realized when it is embedded within broader institutional quality and safety efforts.

Several studies have identified barriers that limit consistent checklist compliance. Among the most frequently reported obstacles are inadequate staffing, heavy workloads, hierarchical workplace culture, staff resistance, insufficient training, poor staff involvement, lack of checklist ownership, and forms that are not well adapted to local practice (Ardhana & Haryanto, 2024; Lim et al., 2023; Paterson et al., 2024; Tesfaye et al., 2025). Conversely, successful implementation is often associated with strong leadership, staff education, multidisciplinary engagement, local champions, timely audit and feedback, and context-appropriate modifications to the checklist (Inge et al., 2025; Lim et al., 2023; Paterson et al., 2024). These findings indicate that checklist compliance is shaped by a combination of individual, professional, and organizational factors rather than by knowledge alone. Research involving nurses and perioperative staff further supports the importance of education, experience, and empowerment in SSC use. Gul et al. (2022) found that compliance improved after an educational intervention, with the greatest improvement observed in sign-out practices such as completion of sponge, needle, and instrument counts. However, improvement was less pronounced in communication-focused behaviors, such as introducing team members by name and role. Sharma et al. (2020) similarly reported that awareness of the WHO SSC was significantly associated with type of training institution and duration of clinical experience, although attitudes were not significantly related to age, gender, qualification, or work history. In addition, Nyberg et al. (2024) found that older and more experienced staff tended to perceive working conditions and management support more positively than their younger or less experienced counterparts. Qualitative evidence also suggests that varying levels of knowledge, communication breakdowns, and the need for nurses to feel confident enough to speak up remain important issues in checklist execution (Willassen et al., 2018).

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The role of contextual and organizational conditions becomes even more evident in low- and middle-income countries, where resource limitations often affect surgical safety efforts. Studies from these settings have identified inadequate training, lack of materials, and resistance to changing workflows as major barriers to SSC adoption, although ongoing education, leadership support, and multidisciplinary cooperation have been shown to improve compliance and outcomes (Tostes et al., 2022). In the Philippines, these concerns are particularly relevant in provincial and community hospitals, where shortages in trained personnel and infrastructure may hinder consistent adherence to perioperative safety standards. Addressing such disparities through investments in surgical training, facility readiness, and monitoring systems is essential to achieving the goals of safe, equitable, and accessible healthcare
under the Universal Health Care framework (PhilHealth, 2024).

The literature also emphasized that surgical safety extends beyond checklist completion. The operating theatre is a highly complex setting in which multiple professionals, technologies, and procedures interact simultaneously, creating opportunities not only for coordinated care but also for contamination, communication breakdown, and preventable error (Wall et al., 2022). A considerable proportion of surgical adverse events are linked to non-technical issues, particularly failures in leadership, teamwork, communication, decision-making, and situational awareness (Knowles, 2024). For this reason, patient safety in surgery is increasingly understood as a systems issue that requires both technical competence and strong collaborative practice. As noted by Allievi et al. (2020), patient safety in surgery demands close attention throughout the entire perioperative journey, while Nofal et al. (2023) emphasized that ensuring safety means not only preventing adverse events but also optimizing every aspect of care to support the best possible outcomes.

Contemporary research also points to complementary approaches that can strengthen the impact of the SSC. Enhanced Recovery After Surgery (ERAS) pathways have shown strong evidence in reducing complications, shortening hospital stay, and lowering costs through coordinated, evidence-based perioperative care (Roulin et al., 2020). Likewise, continuing education, simulation-based training, and competency development have been recognized as valuable strategies for improving team performance and patient safety (Chatterjee, 2023; Lamé & Dixon-Woods, 2020). Emerging technologies such as artificial intelligence-assisted verification systems and radio-frequency identification tools are also being explored as ways to improve checklist efficiency and reduce workload and preventable events (Yu et al., 2024). However, the success of these innovations still depends on organizational acceptance and psychological safety, especially in settings where nurses may encounter resistance when attempting to lead or enforce checklist-related processes (McElroy et al., 2024).

Taken together, the current state of the art affirms that the WHO Surgical Safety Checklist remains one of the most important global tools for improving surgical safety. Its benefits are most evident when implementation is supported by staff training, institutional leadership, effective communication, regular auditing, and a workplace culture that encourages shared accountability (Alsadoun et al., 2024; Krstulović et al., 2025; Tesfaye et al., 2025). At the same time, variability in adherence across settings indicates that checklist effectiveness is shaped by contextual realities such as hierarchy, workload, hospital environment, work experience, and safety climate. Future studies should continue examining these micro-, meso-, and macro-level influences to better understand how compliance can be strengthened across diverse healthcare settings (Inge et al., 2025).

In summary, the literature showed that the SSC is a highly effective but implementation-sensitive safety strategy. When consistently supported by training, monitoring, leadership, and staff engagement, it improves teamwork, strengthens perioperative processes, and reduces preventable harm. Thus, sustained compliance with the SSC should be viewed not merely as a procedural requirement but as a continuing expression of patient safety, professional responsibility, and quality
improvement in surgical care (Ezha et al., 2023; Haugen, 2019; Osaremwinda, 2026).

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Problem in the Field

Although the WHO developed the Surgical Safety Checklist (SSC) to reduce surgical errors and improve patient safety, its consistent use remains a challenge in many healthcare settings. Research indicated that while the checklist is widely implemented, compliance during surgeries is often partial or superficial (Tostes et al., 2022; WHO, 2021). Factors contributing to low adherence include time constraints, limited staff participation, insufficient training, and poor communication among surgical teams. In the Philippines, some surgical teams reportedly follow the checklist only superficially, treating it as a procedural formality rather than a vital safety measure (DOH, 2020).

The inconsistent and incomplete use of the Surgical Safety Checklist reduces its effectiveness in preventing wrong-site surgeries, anesthesia errors, and complications after surgery. Despite the availability of advanced technologies and standardized protocols like the WHO Surgical Safety Checklist, many hospitals still experience adverse events. Factors contributing to this include limited staffing, hierarchical organizational culture, inadequate training, low staff engagement, resistance to implementing the checklist, and concerns about its suitability in local contexts (Lim et al., 2023; PhilHealth, 2024).

In addition, a substantial portion of surgical errors arises from non-technical factors such as leadership challenges, poor situational awareness, flawed decision-making, and, critically, weak collaboration and communication among surgical team members (Knowles, 2024). For these reasons, assessing how consistently surgical teams adhere to the checklist is crucial. Doing so helps identify barriers to proper implementation, strengthen compliance, and cultivate a stronger safety culture within the operating room.

Research Gap

The inconsistent and incomplete use of the Surgical Safety Checklist reduces its effectiveness in preventing wrong-site surgeries, anesthesia errors, and complications after surgery. Despite the availability of advanced technologies and standardized protocols like the WHO Surgical Safety Checklist, many hospitals still experience adverse events. Factors contributing to this include limited staffing, hierarchical organizational culture, inadequate training, low staff engagement, resistance to implementing the checklist, and concerns about its suitability in local contexts (Lim et al., 2023; PhilHealth, 2024). In addition, a substantial portion of surgical errors arises from non-technical factors such as leadership challenges, poor situational awareness, flawed decision-making, and, critically, weak collaboration and communication among surgical team members (Knowles, 2024). For these reasons, assessing how consistently surgical teams adhere to the checklist is crucial. Doing so helps identify barriers to proper implementation, strengthen compliance, and cultivate a stronger safety culture within the operating room.

In addition, workshops were found to have lower impact in hospitals that were not yet familiar with the Surgical Safety Checklist, highlighting the need for broader, multifaceted interventions and strategies aimed at changing organizational culture. However, in institutions that were more open and prepared, brief workshops were able to promote faster behavioural improvement (Nofal, 2023). Other reported obstacles to effective compliance included staff shortages, excessive workload, poor sense of ownership over checklist use, resistance to practice change, weak audit mechanisms, and frequent staff turnover (Habtie, 2025). Merillana (2024) also recommended that operating room nurses pursue postgraduate education and attend relevant seminars and training to remain updated on current developments and trends in OR nursing practice. Although these previous studies are closely related to the present investigation, none specifically examined adherence to surgical safety standards in a Level II private hospital in Sorsogon City. This unaddressed context represents the gap that the current study aims to fill.

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Objectives of the Study

This study aimed to evaluate the adherence to surgical safety standards in Sorsogon Medical Mission Group Hospital and Health Services Cooperative a Level II Hospital in Sorsogon City.

Specifically, it aimed to:

1. Determine level of adherence to surgical safety standards in the operating room;
2. Identify the gaps on adherence to surgical safety standards; and
3. Recommend measures to enhance adherence to surgical safety standards.

Theory

The Theory of Planned Behavior, developed by Icek Ajzen, explains how an individual's behavior is influenced by three key components: attitude toward the behavior, subjective norms, and perceived behavioral control. In the context of surgical safety standards, this theory suggests that healthcare professionals are more likely to adhere to safety protocols when they believe that the checklist improves patient outcomes (positive attitude), when colleagues and institutional policies support its use (subjective norms), and when they feel capable of performing the required safety procedures effectively (perceived behavioral control). For example, when surgeons, anesthesiologists, and operating room nurses collectively recognize the importance of verifying patient identity, confirming the surgical site, and communicating during critical stages of surgery, adherence to safety standards becomes more consistent. Therefore, fostering positive attitudes toward patient safety and strengthening teamwork within the surgical team are essential for effective implementation of safety checklists.

Meanwhile, Human Factors Theory focuses on the interaction between humans, technology, and the work settings. In surgical context, errors may occur not only because of individual mistakes but also due to system-related issues such as poor communication, unclear responsibilities, fatigue, or inadequate equipment design. Surgical safety standards address these challenges by providing structured processes that guided the surgical team through important safety checks before, during, and after procedures. For instance, the sign-in, time-out, and sign-out phases of the surgical safety checklist help ensure that all team members communicate effectively, confirm critical information, and identify potential risks before they lead to adverse events. By recognizing that human error is inevitable, Human Factors Theory emphasizes designing systems that minimize the likelihood of mistakes and promote safer interactions among healthcare professionals.

Lastly, Donabedian's Structure–Process–Outcome Model, developed by Avedis Donabedian, provides a comprehensive framework for assessing healthcare quality. According to this theory, the quality of care depends on three interconnected elements: structure, process, and outcome. Structure refers to the resources and organizational environment, such as trained healthcare personnel, adequate equipment, and institutional policies that support surgical safety practices. Process involves the actual delivery of care, including the consistent implementation of surgical safety checklists and adherence to established safety standards. Outcome refers to the results of care, such as reduced surgical complications, improved patient safety, and better recovery outcomes. Applying this model to surgical safety standards highlights how proper institutional support and consistent compliance with safety protocols can lead to improved patient outcomes.

These three theories collectively emphasize the importance of surgical safety standards in healthcare. The Theory of Planned Behavior explains how healthcare professionals' attitudes and social influences shape their compliance with safety protocols. Human Factors Theory highlights the need to design systems that account for human limitations and promote effective teamwork. Meanwhile, Donabedian's Structure–Process–Outcome Theory provides a framework for evaluating how organizational resources and clinical practices influence patient outcomes. Together, these theoretical perspectives reinforce the critical role of structured safety practices in improving the quality and safety of surgical care.

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Discussion of the Model

This study was rooted in 3 theories, the theory of planned behavior by Icek Aizen this can help understand why healthcare professionals may or may not adhere to the standard. It explains how healthcare professionals' attitudes, perceived norms, and perceived control influence their adherence to the Surgical Safety Standards. Furthermore, all healthcare professionals should possess the general core competencies, regardless of their discipline. The specific content within these competencies differs between disciplines. von Vogelsang A-C, et al. (2020).

Human factor theory can help identify design and implementation issues that may contribute to non-adherence, it highlights how system design, workflow, and implementation issues may contribute to errors or non-adherence. Embedding SSC education into staff orientation and sustained auditing of time-out adherence will support long-term adherence to safety protocols. Osaremwinda, F. (2026)

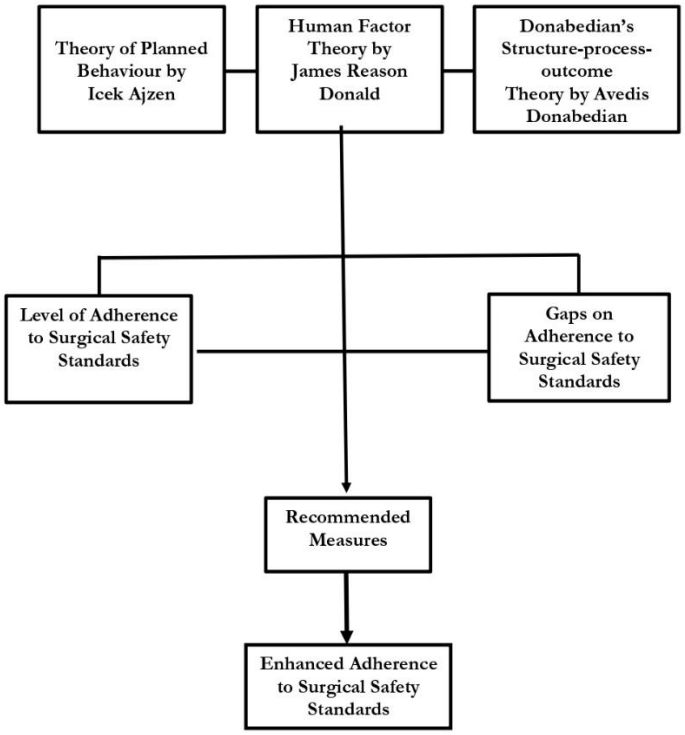

Figure 1. *Conceptual Framework Model*

Donabedian's structure-process-outcome model provides a comprehensive framework for assessing healthcare quality by examining organizational structures, such as hospital policies and available resources, as well as processes like checklist implementation. It underscores the value of patient-centered care and interdisciplinary collaboration in improving outcomes, while emphasizing the role of data-driven measurement and benchmarking in evaluating hospital performance and promoting continuous improvement. Emerging technologies, changes in healthcare policies, and ongoing systemic challenges continue to shape the evolution of healthcare administration (Kanyal, 2023). Guided by these theories, the study employed a quantitative research design. The quantitative component assesses the level of adherence, explores gaps and challenges affecting adherence in the operating room. Findings from quantitative research design serve as the basis for identifying problem areas and formulating evidence-based recommendations aimed at strengthening checklist implementation and enhancing overall surgical safety practices.

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METHODS

Research Design

The method employed in this study was quantitative research design to determine the level of adherence to surgical safety standards in the operating room. The design is appropriate as it allows quantitative approaches to provide a comprehensive understanding of the adherence to surgical safety standards, identification of existing gaps, and recommend measures to improve adherence to surgical safety standards in the operating room.

Research Respondents, Population and Sampling

The study adopted total enumeration wherein the total population consisted of 37 operating room personnel working in a Level II private hospital in Sorsogon City. The respondents were composed of 14 regular operating room nurses, 2 Nursing Attendants, 16 Surgeons, 2 Paediatricians and 3 Anaesthesiologist with at least six months hospital experience.

Research Instruments and Validation

The main tool used in this study was a researcher-developed questionnaire aimed at evaluating adherence to the WHO Surgical Safety Checklist among operating room staff in a Level II private hospital in Sorsogon City. The questionnaire was organized around the key elements of the checklist and relevant literature on surgical safety, covering the three critical surgical phases—sign-in, time-out, and sign-out—with a focus on patient verification, infection control, anesthesia safety, equipment preparation, and team communication.

Responses were collected using a five-point Likert scale, ranging from 1 (Never) to 5 (Always), to indicate the frequency of specific safety practices. To ensure the instrument's validity, a panel of experts in nursing, surgery, and research methodology reviewed the questionnaire, checking that each item was clear, relevant, and aligned with the study's objectives and the standards outlined in surgical safety protocols.

Quantification of Variables

Scale	Range	Adjectival Description
5	4.50 – 5.00	Very high level of Adherence
4	3.50 – 4.49	High level of Adherence
3	2.50 – 3.49	Moderate level of Adherence
2	1.50 – 2.49	Low level of Adherence
1	1.00 – 1.49	Very low level of Adherence

Data Gathering Procedure

The data collection process started after the researcher secured approval from the hospital administration and other relevant authorities at the Level II private hospital in Sorsogon City. A formal letter requesting permission to conduct the study was submitted to the hospital management to ensure all protocols were followed. Once approval was granted, the researcher coordinated with the operating room department to identify eligible participants who were actively involved in surgical procedures. Before distributing the questionnaire, the researcher explained the study's objectives and purpose to all participants, emphasizing that their participation was voluntary. Respondents were informed that the information they provided would remain strictly confidential and would only be used for academic purposes. Informed consent was obtained from each participant prior to initiating data collection, ensuring ethical compliance throughout the process.

The researcher then administered the questionnaire, which was specifically designed based on the WHO Surgical Safety Checklist, to all eligible operating room personnel. The instrument included items related to the three critical phases of surgery—sign-in, time-out, and sign-out—covering areas such as patient verification, infection control, anesthesia safety, equipment preparation, and team communication.

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A Likert scale was used to measure the frequency of adherence, while a ranking scale allowed participants to identify and prioritize perceived gaps in compliance. After participants completed the questionnaires, the researcher collected and reviewed them for completeness. The data were then organized and tabulated systematically, preparing them for statistical analysis. This process allowed the researcher to determine the level of adherence to surgical safety standards and identify any gaps in their implementation, providing a clear picture of current practices in the operating room

Statistical Treatment of Data

The data obtained from respondents were systematically organized, tabulated, and analyzed using appropriate statistical techniques to assess adherence to the WHO Surgical Safety Checklist among operating room staff in a Level II private hospital in Sorsogon City. Frequency and percentage were employed to describe the distribution of respondents' demographic characteristics and their responses to individual questionnaire items. Frequency indicates the number of respondents selecting a particular option, while percentage reflects the proportion of respondents relative to the total sample size. The weighted mean was applied to determine overall adherence to surgical safety standards across the three key phases of surgery: sign-in, time-out, and sign-out. This method allowed the researcher to calculate the average response scores from the Likert scale and interpret the results using a verbal scale, classifying adherence levels as very high, high, moderate, low, or very low. Additionally, ranking was used to identify and prioritize perceived gaps in adherence to the surgical safety checklist. These statistical approaches enabled a systematic analysis of the data and facilitated clear, meaningful presentation of the findings.

Ethical Considerations

This study strictly followed ethical guidelines to safeguard the rights, dignity, and well-being of all participants. Key ethical measures included obtaining informed consent, maintaining confidentiality and anonymity, and observing the principles of non-maleficence, beneficence, justice, and respect for autonomy. Participants were provided with a clear explanation of the study's purpose, objectives, procedures, and anticipated outcomes. Informed consent was obtained prior to participation, and participants were informed that their involvement was voluntary and that they could withdraw at any point. No personal identifiers or names were recorded on the survey forms. All data collected were securely stored in locked cabinets and were accessible only to the researcher. The study posed minimal to no risk—physical, psychological, or social—to participants. The survey questions were designed to address professional practices rather than individual performance or liability. Any potential discomfort from reflecting on safety lapses was minimized by emphasizing that the results were intended for improvement, not for punitive purposes. The findings supported enhancements in adherence to surgical safety standards and operating room protocols. Results were shared with hospital administration to guide training and quality improvement initiatives, and all eligible operating room staff had an equal opportunity to participate. There was no discrimination based on age, gender, profession, or length of service. Participants' decisions are respected throughout the research process. The right to refuse or skip any survey item are honored. Approval from the office of the Chief Nurse, Medical Director's office and Human Resource Development are obtained prior to data collection.

RESULTS

Level of Adherence to Surgical Safety Standards

Table 1. *Respondents' Level of Adherence Before Induction of Anesthesia*

Indicators (sign-in) Before induction of anesthesia	Mean	Adjectival description
1. Surgical team verifies the patient's identity before the procedure.	4.95	Very High Level of Adherence

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2. Patient's allergy history is reviewed prior to anesthesia.	4.76	Very High Level of Adherence
3. Planned surgical procedure and site are confirmed.	4.86	Very High Level of Adherence
4. Patient's medical history is reviewed before induction.	4.65	Very High Level of Adherence
5. Anesthesia equipment is checked and confirmed to be functioning.	4.84	Very High Level of Adherence
6. All medications required for anesthesia are reviewed.	4.84	Very High Level of Adherence
Total	4.82	Very High Level of Adherence

Legend: 1.00-1.49= Very Low Level of Adherence, 1.50-2.49= Low Level of Adherence, 2.50-3.49= Moderate Level of Adherence, 3.50-4.49= High Level of Adherence, 4.50-5.00= Very High Level of Adherence

To ensure patient safety and minimize surgical risks, the Surgical Safety Standards is implemented as a standardized protocol in operating rooms. The first phase of this checklist, commonly referred to as the Sign-In stage, is conducted before the induction of anesthesia to verify critical patient and procedural information. This stage ensures that essential safety measures—such as confirming the patient's identity, reviewing medical history and allergies, and checking anesthesia equipment—are completed to prevent potential errors. The following table presents the respondents' level of adherence to the surgical safety standards during this pre-anesthesia phase.

Table 1 presents the respondents' level of adherence to the Surgical Safety Standards before the induction of anesthesia**.** The mean scores for all six indicators range from 4.65 to 4.95, with standard deviations between 0.229 and 0.588, indicating low variability and consistent adherence among respondents. The highest level of adherence was observed in verifying the patient's identity before the procedure (mean = 4.95), while reviewing the patient's medical history before induction recorded the lowest mean (mean = 4.65). Planned surgical procedure and site confirmation scored a mean of 4.86. Checking anesthesia equipment and reviewing all required medications both had a mean of 4.84. Patient allergy history review had a mean of 4.76. The overall total mean of adherence across all indicators was 4.82, reflecting a very high level of adherence before anesthesia induction.

The second phase of the Surgical Safety Standards, known as the Time-Out stage, is conducted immediately before skin incision. This phase ensures that the entire surgical team pauses to reconfirm critical information, communicate important aspects of the procedure, and verify that all necessary preparations have been completed. By promoting clear communication and teamwork among the surgical staff, the Time-Out process helps prevent surgical errors and enhances patient safety. The following table presents the respondents' level of adherence to the surgical safety standards before skin incision.

Table 2. *Respondents' Level of Adherence Before Skin Incision*

Indicators (time-out) before skin incision	Mean	Adjectival description
1. All members of the surgical team introduce themselves and state their roles.	4.78	Very High Level of Adherence
2. Patient's identity and the planned procedure are reconfirmed.	4.84	Very High Level of Adherence
3. Surgeon communicates the critical steps of the procedure.	4.51	Very High Level of Adherence

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4. Team discusses potential complications that may arise.	4.51	Very High Level of Adherence
5. Team reviews whether antibiotic prophylaxis was administered.	4.73	Very High Level of Adherence
6. Imaging results relevant to the procedure are reviewed.	4.65	Very High Level of Adherence
7. Surgical site marking is verified.	4.84	Very High Level of Adherence
8. Patient's positioning is confirmed to be correct.	4.81	Very High Level of Adherence
9. All necessary equipment and supplies are confirmed to be available.	4.78	Very High Level of Adherence
Total	4.72	Very High Level of Adherence

Legend: 1.00-1.49= Very Low Level of Adherence, 1.50-2.49= Low Level of Adherence, 2.50-3.49= Moderate Level of Adherence, 3.50-4.49= High Level of Adherence, 4.50-5.00= Very High Level of Adherence

Table 2 shows the respondents' level of adherence to the Surgical Safety Standards before skin incision**.** The mean scores for all nine indicators range from 4.51 to 4.84, indicating generally consistent adherence with slightly higher variability in some items. The highest adherence was recorded for reconfirming the patient's identity and planned procedure (mean = 4.84) and verification of surgical site marking (mean = 4.84). Patient positioning confirmation had a mean of 4.81. Introduction of surgical team members and stating their roles, as well as confirmation of necessary equipment and supplies, both scored a mean of 4.78. Review of antibiotic prophylaxis had a mean of 4.73, while imaging results review scored 4.65. The lowest adherence scores were observed in communication of critical steps of the procedure and discussion of potential complications, both with a mean of 4.51. The overall total mean adherence before skin incision was 4.72, indicating a very high level of adherence across all indicators.

Table 3. *Respondents' Level of Adherence Before Patient Leaves Operating Room*

Indicators (sign-out) before patient leaves operating room	Mean	Adjectival description
1. Surgical team confirms the name and completion of the procedure performed.	4.68	Very High Level of Adherence
2. Sponge, sharps, and instrument counts are completed and verified.	4.97	Very High Level of Adherence
3. All specimen labels are checked for accuracy.	4.84	Very High Level of Adherence
4. Any equipment issues encountered during the procedure are addressed.	4.84	Very High Level of Adherence
5. The team reviews the postoperative care plan.	4.68	Very High Level of Adherence
6. Recovery instructions are discussed and confirmed.	4.78	Very High Level of Adherence
7. Team discusses any concerns or complications encountered during the procedure.	4.41	High Level of Adherence
Total	4.74	Very High Level of Adherence

Legend: 1.00-1.49= Very Low Level of Adherence, 1.50-2.49= Low Level of Adherence, 2.50-3.49= Moderate Level of Adherence, 3.50-4.49= High Level of Adherence, 4.50-5.00= Very High Level of Adherence

The final phase of the Surgical Safety Standards is the Sign-Out stage, which is conducted before the patient leaves the operating room. This stage focuses on ensuring that all critical postoperative procedures and documentation are properly completed. It includes confirming the procedure performed, verifying instruments and sponges counts, checking specimen labeling, and discussing postoperative care

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plans and recovery instructions. This process helps ensure continuity of care, prevent retained surgical items, and address any issues encountered during the procedure. The following table presents the respondents' level of adherence to the surgical safety checklist before the patient leaves the operating room.

Table 3 presents the respondents' level of adherence to the Surgical Safety Standards before the patient leaves the operating room. The mean scores for the seven indicators range from 4.41 to 4.97, indicating generally very high adherence with some variability. The highest adherence was observed in completing and verifying sponge, sharps, and instrument counts (mean = 4.97). Checking specimen labels and addressing equipment issues both had a mean of 4.84. Discussion of recovery instructions scored a mean of 4.78. Confirmation of procedure completion and review of the postoperative care plan both scored 4.68. The lowest adherence was noted in discussing any concerns or complications during the procedure, with a mean of 4.41. The overall total mean adherence before patient leave was 4.74, indicating a very high level of adherence across all indicators.

Gaps on adherence to surgical safety standards

Table 4. *Frequency Distribution and Percentage of the Gaps On Adherence to Surgical Safety Standards (n=37)*

Indicators: (GAPS)	Frequency Count	Percentage (%)
1. Lack of awareness to checklist	1	2.70
2. Lack of training	-	-
3. Lack of manpower	1	2.70
4. Lack of teamwork and communication	-	-
5. Appropriateness of checklist	1	2.70
6. Weak audit system	21	56.76
7. High workloads	1	2.70
8. Fatigue and burnout	3	8.11
9. Limited resources	1	2.70
10. Conducive workplace	2	5.41

To further understand factors that may hinder the effective implementation of the Surgical Safety Standards, it is important to identify existing gaps that may influence the level of adherence among surgical staff. These gaps may stem from organizational, human, or resource-related factors that affect the consistent application of safety procedures in the operating room. Recognizing these challenges provides valuable insight for improving compliance, strengthening patient safety practices, and enhancing the overall effectiveness of surgical protocols. The following table presents the frequency distribution and ranking of the identified gaps in adherence to surgical safety procedures.

Table 4 presents the frequency distribution and percentage of the identified gaps in adherence to the Surgical Safety Checklist among the respondents (n = 37). The results indicate that among the listed indicators, weak audit system emerged as the most frequently identified gap, with 21 respondents or 56.76% indicating it as a concern. This finding suggests that more than half of the respondents perceive deficiencies in the monitoring, evaluation, or enforcement of surgical safety procedures. A weak auditing mechanism may limit the ability of hospital management to consistently check compliance, provide feedback, and ensure accountability among surgical team members, thereby affecting the sustainability of safety practices in the operating room.

The second most reported gap was fatigue and burnout, which was identified by 3 respondents or 8.11% of the total sample. Although the percentage is relatively lower compared to the top gap, it still indicates that physical and mental exhaustion among healthcare professionals may influence their performance and adherence to safety protocols. Fatigue and burnout can affect concentration, communication, and decision-making, which are essential components of safe surgical practice.

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Meanwhile, conducive workplace was cited by 2 respondents or 5.41% as a gap. This suggests that some respondents perceive that aspects of the work environment—such as organizational culture, support systems, or workplace conditions—may influence how consistently surgical safety procedures are followed.

Several other indicators were reported by only 1 respondent each (2.70%), including lack of awareness of the checklist, lack of manpower, appropriateness of the checklist, high workloads, and limited resources. The low frequency of these responses indicates that these factors are perceived as relatively minor concerns among the respondents. Their minimal occurrence may imply that most surgical staff are already familiar with the checklist, that staffing levels and resources are generally adequate, and that the checklist is largely considered appropriate for use in their surgical setting.

Notably, lack of training and lack of teamwork and communication recorded zero responses, indicating that none of the respondents identified these factors as gaps in adherence to surgical safety procedures. This result suggests that the respondents generally perceive themselves as adequately trained and capable of collaborating effectively with other members of the surgical team. Effective teamwork and communication are essential elements in maintaining a safe surgical environment, and the absence of these factors as perceived gaps may reflect the presence of strong professional collaboration and established training practices within the institution.

Overall, the findings reveal that while adherence to surgical safety procedures is generally supported by adequate awareness, training, and teamwork, system-level factors—particularly the weakness of the audit system—remain a major area of concern. Strengthening monitoring mechanisms, implementing regular compliance checks, and providing structured feedback systems may therefore help improve the consistency and sustainability of adherence to surgical safety protocols. Addressing issues related to fatigue, workplace environment, and other minor gaps may also further enhance the effectiveness of surgical safety practices.

Measure to Enhance Adherence to Surgical Standards

Based on the findings presented in Tables 1.1, 1.2, and 1.3, the respondents demonstrated a very high level of adherence to the Surgical Safety Standards across the three critical phases of surgical procedures: Sign-In, Time-Out, and Sign-Out. The overall mean scores of 4.82, 4.72, and 4.74, respectively, indicate that the surgical team consistently performs the required safety checks before anesthesia induction, before skin incision, and before the patient leaves the operating room. These results suggest that the institution has already established strong compliance with patient safety protocols and that the surgical staff recognizes the importance of structured safety practices in preventing surgical errors. However, despite this very high level of adherence, certain indicators obtained relatively lower mean scores compared to others, particularly in the communication of critical surgical steps (M = 4.51), discussion of potential complications (M = 4.51), and discussion of concerns or complications encountered during the procedure (M = 4.41). These findings indicate that although checklist items are being followed, communication-related components may require further strengthening to ensure comprehensive implementation of safety procedures.

Furthermore, the findings in Table 4 identified several gaps affecting adherence to the Surgical Safety Standards, with weak audit system (56.76%) emerging as the most prominent concern among respondents. This indicates that more than half of the surgical staff perceive that monitoring, evaluation, and enforcement mechanisms related to checklist implementation may not be sufficiently strong. Without a consistent auditing process, compliance with the standards may gradually decline or become routine documentation rather than an active safety practice. In addition, fatigue and burnout (8.11%) and workplace conditions (5.41%) were also reported as potential gaps, suggesting that workload and environmental factors may influence how consistently safety protocols are practiced. Although other factors such as lack of awareness, manpower, resources, and checklist appropriateness were reported minimally, their presence

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still highlights the need for continuous improvement strategies to sustain the effectiveness of surgical safety practices.

In response to these findings, several measures may be proposed to enhance adherence to the Surgical Safety Standards. First, the institution may establish a strengthened audit and monitoring system to ensure consistent compliance with safety protocols. This may include the designation of a surgical safety officer or quality assurance team responsible for conducting regular checklist audits, reviewing compliance reports, and providing feedback to the surgical team. Periodic monitoring may help identify areas requiring improvement and reinforce accountability among healthcare professionals. Additionally, implementing regular surgical safety review meetings or debriefing sessions may allow team members to discuss challenges encountered during procedures, promote transparency, and encourage continuous learning. Such mechanisms will help transform the checklist from a routine requirement into an active tool for patient safety improvement.

Second, enhancing communication practices during the Time-Out and Sign-Out stages is essential in addressing the lower-scoring indicators observed in the study. Structured communication strategies, such as standardized briefing and debriefing protocols, may encourage surgical teams to actively discuss critical steps, possible complications, and postoperative concerns before and after procedures. Hospitals may also conduct periodic simulation exercises and interprofessional training programs to strengthen teamwork, situational awareness, and collaborative decision-making in the operating room. These initiatives may further improve team coordination and ensure that all members are actively engaged in the surgical safety process.

Finally, the institution may consider implementing wellness and workload management programs to address issues related to fatigue and burnout among healthcare professionals. Ensuring adequate staffing, proper scheduling of surgical procedures, and opportunities for rest and professional support may help maintain the physical and mental well-being of surgical staff. A supportive workplace environment encourages healthcare professionals to remain attentive, engaged, and compliant with safety practices. Overall, while the findings demonstrate a very high level of adherence to the Surgical Safety Standards, the implementation of strengthened auditing systems, improved communication strategies, and supportive workplace policies may further enhance the sustainability and effectiveness of surgical safety practices, ultimately contributing to improved patient outcomes and quality of care.

DISCUSSIONS

This section interprets the results of the study on adherence to the Surgical Safety Standards in a Level II private hospital in Sorsogon City. It aims to analyze the level of compliance across the three phases of the standards—before induction of anesthesia, before skin incision, and before patient leave from the operating room—identify the gaps affecting adherence and provide insights for enhancing compliance. The discussion focuses on presenting patterns observed in the data, explaining variations in adherence, and highlighting areas that require improvement to ensure patient safety and effective surgical practices.

Level of Adherence to Surgical Safety Standards

The findings of the study revealed a very high level of adherence to the Surgical Safety Standards across the three critical stages of surgical care—Sign-In, Time-Out, and Sign-Out, as reflected by the overall mean scores of 4.82, 4.72, and 4.74 respectively. These results suggest that the surgical team consistently follows standardized safety procedures to ensure patient safety and reduce surgical risks. The highest adherence during the Sign-In phase was observed in verifying the patient's identity before the procedure ($M = 4.95$), highlighting the importance placed on preventing wrong-patient or wrong-procedure incidents. This finding aligns with the recommendations of the World Health Organization, which emphasizes patient identification as a critical safety step in surgical procedures. Recent studies also support this result. For

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instance, Getahun et al., (2020) reported that verification of patient identity and procedure is among the most consistently followed components of surgical safety protocols because it is considered a fundamental requirement for preventing sentinel events in operating rooms.

Similarly, the results indicate high compliance with safety checks related to anesthesia preparation, including reviewing allergies, confirming anesthesia equipment functionality, and reviewing required medications. The consistent adherence to these practices reflects the surgical team's awareness of the risks associated with anesthesia-related complications. According to Atul Gawande and subsequent research building on his work, adherence to pre-anesthesia safety protocols significantly reduces preventable surgical complications. More recent evidence by Hebbard (2021) also found that structured pre-induction safety checks improve team preparedness and reduce anesthesia-related adverse events. The relatively lower mean score for reviewing patient medical history (M = 4.65), although still categorized as very high adherence, may indicate that some aspects of preoperative evaluation require further reinforcement to ensure complete patient assessment before anesthesia induction.

During the Time-Out phase, the results likewise demonstrate very high adherence, particularly in reconfirming the patient's identity and verifying surgical site marking (M = 4.84). These findings reinforce the importance of surgical pause protocols, which provide the team an opportunity to confirm critical procedural details. Studies conducted by Gillespie et al., (2020) reported that structured time-out processes significantly enhance team communication and reduce the likelihood of wrong-site surgeries. However, the present findings show comparatively lower scores in the communication of critical surgical steps and the discussion of potential complications (M = 4.51). This suggests that while procedural checks are consistently performed, deeper communication regarding operative risks may sometimes receive less emphasis. Similar observations were reported by McDonald, (2022) who noted that surgical teams often comply with checklist documentation but may vary in the depth of communication during time-out discussions.

In the Sign-Out phase, adherence remained very high, particularly in verifying sponge, sharps, and instrument counts (M = 4.97), which is essential in preventing retained surgical items. This result is consistent with the findings of Haynes, (2019) who emphasized that proper counting procedures are among the most reliable safeguards against postoperative complications associated with retained instruments. The findings also show strong compliance in specimen labeling and equipment issue reporting, reflecting the team's attention to postoperative documentation and patient continuity of care. Nevertheless, the lowest score was observed in discussing concerns or complications encountered during the procedure (M = 4.41), indicating potential gaps in postoperative team communication. Evans, (2023) suggests that structured debriefings after surgery can significantly enhance learning, error reporting, and team performance. Overall, the results indicate that while adherence to the surgical safety checklist is very high, strengthening communication during time-out and sign-out discussions may further enhance patient safety outcomes and surgical team collaboration.

Gaps on adherence to surgical safety standards

The findings in Table 4 highlight several gaps that may influence adherence to the Surgical Safety Standards among the respondents. Among the identified indicators, a weak audit system emerged as the most frequently reported gap, with more than half of the respondents (56.76%) identifying it as a concern. This suggests that while surgical teams may be familiar with and generally compliant with the checklist procedures, the absence of a strong monitoring and evaluation mechanism may hinder consistent enforcement and sustainability of safety practices. Effective auditing systems are critical in ensuring that safety protocols are not only implemented but also regularly evaluated for compliance and improvement. Studies have emphasized that institutional monitoring and feedback systems play a crucial role in reinforcing checklist adherence and strengthening patient safety culture within surgical teams. For instance, research has shown that hospitals with structured audit and feedback mechanisms demonstrate significantly higher compliance with surgical safety protocols and improved clinical outcomes.

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The prominence of weak auditing as a gap is supported by recent literature emphasizing the role of governance and monitoring in sustaining safety initiatives. A study by Haynes, (2019) noted that continuous monitoring and evaluation are essential components for successful implementation of surgical safety programs. Similarly, research conducted by Gillespie et al., (2020) found that regular auditing and feedback significantly improve checklist compliance and team accountability in operating rooms. Without consistent evaluation, safety checklists may become routine paperwork rather than meaningful safety practices. The current findings therefore highlighted the importance of strengthening institutional oversight mechanisms to ensure that adherence to safety protocols remains effective and sustainable.

Another gap identified by the respondents is fatigue and burnout, which was reported by 8.11% of the participants. Although this percentage is relatively lower compared with the weak audit system, it still indicates that workload-related stress and exhaustion can influence adherence to safety practices. Healthcare professionals working in high-pressure environments such as operating rooms often experience physical and emotional fatigue, which may affect attention, communication, and decision-making during surgical procedures. Studies conducted by Shanafelt et al., (2021) have shown that burnout among healthcare workers is associated with reduced adherence to patient safety protocols and increased risk of medical errors. In addition, recent research in perioperative settings suggests that fatigue may reduce the effectiveness of team communication and checklist engagement, particularly during lengthy or complex surgical procedures.

Other factors such as conducive workplace conditions (5.41%), lack of awareness, lack of manpower, appropriateness of the checklist, high workloads, and limited resources were reported by only a small proportion of respondents (2.70% each). These findings suggest that these factors are not widely perceived as major barriers to checklist adherence within the institution. Interestingly, lack of training and lack of teamwork and communication were not identified as gaps by any of the respondents. This may indicate that the surgical team possesses adequate knowledge of the checklist and maintains effective collaboration within the operating room. Evans, (2023) supports the idea that strong teamwork and communication significantly enhance adherence to safety protocols and contribute to better surgical outcomes. Overall, the findings imply that while individual and team-related factors appear well established in the institution, improvements in system-level mechanisms—particularly auditing and monitoring—are necessary to strengthen the consistent implementation of surgical safety practices.

Measure to enhance adherence to surgical standards

The findings indicated that respondents demonstrated a very high level of adherence to the Surgical Safety Standards across the Sign-In, Time-Out, and Sign-Out phases, as reflected in the overall mean scores of 4.82, 4.72, and 4.74. These results suggest that the surgical team consistently implements critical safety procedures before anesthesia induction, before skin incision, and before the patient leaves the operating room. High compliance with checklist protocols reflects the growing institutional recognition of structured safety practices as essential tools for preventing surgical errors and improving patient outcomes. Evidence from the World Health Organization highlights that systematic use of the surgical safety checklist significantly reduces postoperative complications and mortality when properly implemented in operating rooms. Similarly, research conducted by Haynes et al., (2019) demonstrated that consistent application of the checklist improves team coordination and patient safety outcomes in surgical settings.

Despite the very high adherence observed in this study, some indicators related to team communication, such as communicating critical surgical steps and discussing potential complications, obtained relatively lower mean scores compared with other indicators. This suggests that although procedural components of the checklist are followed, deeper communication among team members during surgical procedures may still require reinforcement. Studies have shown that effective communication during surgical briefings and time-outs is a critical factor in maximizing the effectiveness of the checklist. For instance, research by Gillespie et al., (2020) emphasized that communication-focused checklist practices significantly improve teamwork, situational awareness, and error prevention in the operating

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room. Similarly, recent studies highlight that the effectiveness of surgical checklists depends not only on completion of the items but also on meaningful team engagement and active dialogue among surgical personnel.

The findings also revealed that a weak audit system emerged as the most prominent gap affecting adherence to the checklist, with 56.76% of respondents identifying it as a concern. This result indicated that although surgical teams generally follow the checklist, monitoring and evaluation systems may not be sufficiently strong to sustain long-term compliance. Regular auditing and feedback are widely recognized as essential mechanisms for reinforcing safety practices and maintaining accountability among healthcare professionals. According to studies on patient safety governance, institutions that implement structured auditing and feedback systems demonstrate significantly higher compliance with safety protocols and improved patient outcomes. Evans, (2023) emphasized that continuous monitoring and feedback mechanisms strengthen safety culture and ensure that checklists are used as active decision-support tools rather than routine documentation.

In response to these findings, the implementation of strengthened monitoring systems, improved communication strategies, and supportive workplace policies may further enhance adherence to the surgical standards. Establishing regular audits, feedback sessions, and structured surgical debriefings can help reinforce compliance and encourage continuous improvement in safety practices. Additionally, promoting structured communication strategies during the Time-Out and Sign-Out phases may improve discussion of critical surgical steps and potential complications. Addressing factors such as fatigue and burnout through wellness programs and workload management may also support sustained adherence to safety protocols. Studies on healthcare workforce well-being suggest that reducing burnout among surgical staff contributes to improved concentration, teamwork, and compliance with patient safety procedures. As emphasized in global patient safety initiatives led by the World Health Organization, strengthening institutional systems, communication practices, and staff well-being are key strategies for sustaining effective surgical safety practices and improving the overall quality of healthcare delivery.

CONCLUSIONS

The findings indicated that the surgical team demonstrated a consistently very high level of adherence to the Surgical Safety Standards across all three phases—sign-in, time-out, and sign-out. Critical safety steps such as patient identity verification, surgical site confirmation, and instrument counts were performed with the highest compliance, reflecting strong integration of standardized safety protocols into routine practice. However, slightly lower adherence in communication-dependent components, such as discussing potential complications and concerns, suggests that while procedural compliance is strong, team-based communication processes require further strengthening.

Although overall adherence to the SSC was very high, the study identified key gaps that may affect optimal implementation. The most significant gaps included lack of training, lack of teamwork and communication, and insufficient awareness of the checklist. Human factors such as fatigue and burnout also contributed to variability in adherence, particularly in communication-heavy steps. These findings indicated that adherence is influenced not only by procedural knowledge but also by team dynamics, organizational culture, and workload conditions.

The study highlighted that while adherence to the SSC is already very high, targeted enhancement measures are necessary to address remaining gaps related to training, teamwork, communication, and human factors. Strengthening these areas is essential to translate high compliance into consistently improved surgical safety outcomes. A comprehensive approach that integrates education, monitoring, communication reinforcement, and organizational support is critical for sustaining a strong patient safety culture.

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Recommendations

The findings of the study highlighted the importance of sustaining and further enhancing adherence to the Surgical Safety standards within the hospital setting. To maintain the very high level of compliance observed, it is recommended that the hospital continue reinforcing standards implementation through regular monitoring, refresher trainings, and simulation-based exercises. Continuous professional development activities can help ensure that surgical team members remain knowledgeable and competent in the proper use of the SSC. Emphasis should be placed on strengthening structured communication during the time-out and sign-out phases, where collaborative discussion among team members is essential. Encouraging assertive communication, promoting interdisciplinary teamwork, and integrating non-technical skills training will help ensure that all components of the SSC, especially those requiring active dialogue, are consistently and effectively performed.

In addition, hospital management should prioritize the implementation of structured training programs and initiatives that promote teamwork and shared accountability among operating room personnel. Developing interdisciplinary collaboration and enhancing awareness regarding the significance of the SSC in preventing surgical errors can further strengthen adherence. Establishing regular audit and feedback systems is also recommended to monitor compliance and identify areas for improvement. These mechanisms can serve as valuable tools for continuous quality improvement by providing timely insights into performance and encouraging staff to maintain high standards. Moreover, strategies aimed at managing workload, preventing burnout, and fostering a positive communication culture in the operating room environment should be implemented to support sustainable adherence to safety protocols.

Furthermore, the institution may consider adopting a comprehensive and multi-faceted improvement plan to reinforce surgical safety practices. Such a plan may include continuous professional development programs, simulation-based team training, structured preoperative briefings and postoperative debriefings, and the use of visual reminders within the operating room to reinforce checklist completion. Strengthening audit and feedback mechanisms can also help maintain accountability and ensure consistent adherence to the SSC. In addition, ensuring adequate staffing, proper workload distribution, and supportive leadership will help mitigate fatigue-related risks among healthcare professionals. Through the integration of these combined strategies, the hospital can further strengthen its commitment to patient safety, enhance the effectiveness of surgical team collaboration, and maintain excellence in the delivery of high-quality patient care.

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