
Assessing the Relationship Between Perioperative Nurses' Knowledge of Surgical Time Out and Its Key Components: A Correlational-Comparative Study

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ABSTRACT

This study examined the relationship between perioperative nurses' knowledge of the Surgical Time-Out (STO) procedure and their compliance with its key safety components during routine operating room practice. Surgical Time-Out was a critical, standardized patient safety protocol designed to prevent wrong-site, wrong-procedure, or wrong-patient surgical errors by ensuring accurate patient identification, precise surgical site verification, and clear confirmation of the intended procedure before any incision was made. The results revealed significant findings regarding the depth of knowledge, clarity of understanding, and practical application of Surgical Time-Out protocols among the respondents. Specifically, the study assessed the extent to which nurses consistently adhered to essential elements, including effective interdisciplinary team communication, systematic verification of patient identity, unequivocal confirmation of the surgical procedure and operative site, and active coordination among all members of the surgical team. Furthermore, statistical analysis identified statistically significant relationships between demographic variables– including years of experience, educational background, and training attendance– and the measured levels of knowledge and compliance. The findings provided valuable, evidence-based insights into the direct correlation between nurses' knowledge levels and their consistent compliance with established patient safety protocols, highlighting the urgent need for continuous professional education, regular competency enhancement, and ongoing reinforcement of safety procedures across all surgical settings. Strengthening perioperative nurses' theoretical knowledge and adherence to Surgical Time-Out protocols can significantly improve overall patient safety culture and minimize the risk of preventable surgical errors.

Keywords: Surgical Time-Out, perioperative nurses, patient safety, operating room protocols, surgical safety checklist

INTRODUCTION

The operating room is a high-acuity environment characterized by complex procedures and time-sensitive demands, where patient safety remains the foremost priority. Surgical Time-Out (STO) protocols serve as critical, standardized safeguards designed specifically to prevent wrong-site, wrong-procedure, and wrong-patient errors. Despite widespread adoption of these guidelines in healthcare institutions globally, a persistent gap remains between established standards and actual clinical practice. Perioperative nurses, as primary implementers and final checks in the safety system, are influenced by multiple factors including professional knowledge, institutional culture, workload, and team dynamics. This study examined the relationship between nurses' level of knowledge regarding STO principles and their compliance with key components, while also measured and compared how demographic and

professional attributes shaped practice. Findings provided evidence-based insights to enhance targeted education, strengthen safety culture, and ultimately reduce preventable risks in surgical care.

Statement of the Problem

This study assessed perioperative nurses' knowledge of and compliance with the Surgical Time-Out (STO) a mandatory WHO safety protocol– aiming to improve outcomes and teamwork. Specifically, it answered the following:

1. What was the respondents' profile: age, sex, experience, education, training, hospital type, and procedure frequency?
2. What was their level of knowledge regarding STO rationale: patient identification, site/procedure confirmation, communication, and error prevention?
3. What was the extent of compliance: protocol adherence, team collaboration, and documentation?
4. Was there a significant relationship between knowledge and compliance?
5. Did demographic characteristics relate to knowledge and compliance levels?
6. What recommendations could strengthen nurses' knowledge and adherence?

Scope and Delimitations

This quantitative correlational-comparative study assessed perioperative nurses' knowledge of and compliance with Surgical Time-Out protocols in selected tertiary hospitals in Cavite, examining relationships with professional experience, educational attainment, and training exposure. Eligible participants were licensed nurses with at least one year of operating room experience who regularly participated in STO implementation. Findings applied only to similar healthcare settings; relied on self-reports, which carry potential response bias; excluded contributions from other surgical team members; and measured compliance based on stated guidelines rather than direct observation. Despite these constraints, results remained valid and useful for guiding safety improvements and future research.

Review of Related Literature

Surgical Time-Out (STO) is a mandatory safety pause established by the World Health Organization and Joint Commission standards and has been widely shown to reduce surgical complications and errors (Habtie et al., 2025; Ullah et al., 2024). Endorsed by the Association of Perioperative Registered Nurses and the American College of Surgeons, it fosters clear communication and hazard detection, significantly improving safety outcomes (Alagbe-Briggs et al., 2024; Dirie et al., 2025). Perioperative nurses are central to effective STO execution, yet knowledge of its components varies widely in practice, creating gaps that directly reduce compliance (Kozusko et al., 2019; Kim et al., 2020; Gong et al., 2021). Adherence is often undermined by workload pressures, hierarchical barriers, and reliance on mechanical compliance, while incomplete verification remains a persistent issue (Papadakis et al., 2019;

Fourcade et al., 2020). Quality measurement must therefore assess completeness and team engagement rather than mere occurrence (Russ et al., 2019). Targeted education, simulation training, and leadership support are evidence-based strategies that have been shown to strengthen knowledge, adherence, and safety culture (Ferorelli et al., 2022; Nofal et al., 2023).

Theoretical Framework

This study was grounded in Reason's Swiss Cheese Model, Benner's Novice-to-Expert Theory, and King's Goal Attainment Theory. These frameworks explained how knowledge acted as a safety barrier, how experience shaped competence, and how understanding drove compliant practice.

Conceptual Framework

Knowledge of Surgical Time-Out served as the independent variable that influenced compliance, the dependent variable. Demographic factors— including experience, education, and training—moderated this relationship. The framework guided correlational-comparative analysis to determine how knowledge and professional characteristics shaped adherence to safety protocols.

METHODOLOGY

This quantitative correlational-comparative study assessed perioperative nurses' knowledge and compliance, examined their relationship, and compared outcomes according to professional characteristics.

Research Design

This study utilized purposive sampling, specifically criterion-based sampling, to select respondents who met predefined eligibility criteria, ensuring they possessed the required qualifications and direct professional experience relevant to the STO protocol.

Research Steps

After securing ethical approval and necessary institutional permits, coordination with participating hospitals was established. Eligible perioperative nurses were selected using criterion-based sampling, followed by the administration of validated questionnaires to assess knowledge of Surgical Time-Out protocols and compliance levels.

Data Collection and Sample Selection

Data collection commenced upon obtaining required clearances, with respondents selected through purposive criterion sampling to ensure relevant qualifications and experience. A researcher-made questionnaire— designed to gather demographic data and measure knowledge and compliance— underwent expert content validation and pilot testing to ensure validity and reliability.

Data Analysis

Quantitative data were analyzed using descriptive and inferential statistics via SPSS 26. Frequency, percentage, mean, and standard deviation were used to describe profiles, knowledge, and compliance. Correlation, *t*-test, and ANOVA were used to examine relationships and group differences at $\alpha = 0.05$.

Dissemination Plan and Ethical Consideration

Findings were disseminated through peer-reviewed journals, research conferences, institutional reports, and professional platforms to enrich surgical safety knowledge and guide practice and policy. The study obtained ethical approval prior to data collection, ensuring participants' rights, welfare, and safety were strictly protected throughout the research process.

RESULTS AND DISCUSSION

SOP1. The demographic profile revealed that participants were predominantly young, highly educated, professionally trained, and clinically experienced— characteristics typically associated with adherence to established safety protocols.

SOP2. Respondents demonstrated strong consensus that the Surgical Time-Out was a critical safety measure, recognized for preventing serious adverse events such as wrong-site or wrong-patient surgery and for fostering collective accountability; nurses clearly understood its fundamental role in safeguarding patient safety.

SOP3. While compliance with the protocol was generally observed, implementation was not uniform across settings, varying notably by work environment and institutional systems. This finding underscored the necessity of continuously reinforcing safety culture to ensure adherence became a consistent practice rather than an irregular activity.

SOP4. Although knowledge of procedural steps was high among all respondents, consistent compliance depended more strongly on supportive leadership, a positive safety culture, manageable workloads, and adequate time allocation. This indicated that gaps existed not in understanding, but in the practical application of knowledge within daily practice.

SOP5. Significant relationships were identified between professional attributes and study variables. Higher educational attainment, completion of safety training, and early-career status were positively associated with superior knowledge levels and greater compliance, highlighting these as key areas for targeted improvement.

Overall, the findings indicated that while knowledge and awareness of the Surgical Time-Out were well-established, consistency in practice and institutional support remained essential to fully realize its safety benefits.

SUMMARY

Respondents were young, highly educated, and safety-trained, with consistently high knowledge of all protocol components. Compliance varied by context, and there was no

significant correlation between knowledge and adherence ($r = 0.097$, $p > 0.05$). Education, training, and practice frequency significantly predicted better outcomes; age, sex, and hospital type did not. Knowledge alone was insufficient—consistent practice and support remain essential.

CONCLUSIONS

In summary, this research underscored the significant relationships between nurses' professional profiles, their comprehensive knowledge of STO protocols, and their compliance with safety standards. Strengthening perioperative nurses' knowledge through continuing education, enhancing adherence to safety procedures, and reinforcing a robust safety culture within surgical settings were identified as critical priorities. These efforts could significantly improve patient safety and effectively reduce the risk of surgical errors.

RECOMMENDATIONS

This study provided valuable insights to support continuous education, competency enhancement, and consistent reinforcement of safety protocols. The findings contributed meaningful evidence to global efforts aimed at advancing perioperative patient safety and served as a basis for targeted improvements in clinical practice.

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AI DECLARATION STATEMENT

AI-supported tools helped with grammar and structure in creating this article. No AI tools were used to collect, analyze, or interpret data; all authors are credited for their academic contributions.

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