Surgical Safety Checklist Compliance in a Private Hospital Setting: A Study from Port Harcourt Nigeria

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Abstract	Original Research Article

Background: The World Health Organization (WHO) Surgical Safety Checklist is a global tool designed to enhance surgical safety through improved team communication and adherence to critical protocols. Despite its widespread adoption, variations in implementation persist, particularly in private healthcare settings.

Aim: This study examined the level of adherence to the WHO Surgical Safety Checklist in a private hospital in Port Harcourt, with emphasis on its impact on communication, teamwork, and patient safety.

Methods: A retrospective cross-sectional design was employed. Data were collected over four years through a review of completed surgical checklists and real-time intraoperative observations. Descriptive statistics, including frequencies and percentages, were used for analysis.

Results: Of the 86 healthcare personnel surveyed, 88% were aware of the checklist, and 79% had comprehensive understanding of its components. Adherence was highest in-patient identity verification (98%) and anaesthesia safety checks (89%). Conversely, compliance was lowest in surgical site marking (73%) and Sign Out verification (65%). The majority acknowledged the checklist's positive impact on communication (85%), teamwork (84%), and reduction of surgical errors (79%). Nevertheless, only 55% reported that adherence was consistently enforced.

Conclusion: The WHO Surgical Safety Checklist is recognised as an effective tool for enhancing communication and patient safety during surgery. Nonetheless, inconsistent adherence to certain components remains a challenge. The study recommends targeted training, regular audits, and strengthened enforcement mechanisms to ensure full integration of the checklist into surgical practice.

Keywords: WHO Surgical Safety Checklist, Surgical Safety, Team Communication, Patient Safety, Private Hospital, Checklist Adherence, Intraoperative Evaluation.

INTRODUCTION

Surgical safety remains a significant concern in modern healthcare due to the potential for adverse events arising from complex operative procedures. Globally, a substantial proportion of surgical complications and errors are attributed to breakdowns in communication, failure to verify critical patient details, and deviations from standard operating protocols[1]. In response to these challenges, the World Health Organization (WHO) introduced the Surgical Safety Checklist in 2008 as part of its Safe Surgery Saves Lives initiative. This tool was developed to promote consistency, communication, and adherence to fundamental safety practices during surgical procedures[2].

The WHO Surgical Safety Checklist consists of three critical phases—**Sign In**, **Time Out**, and **Sign Out**—each designed to guide surgical teams through essential safety verifications. These stages encompass confirmation of patient identity, surgical site and procedure, anaesthetic safety, equipment readiness, and post-operative plans[3,4]. Studies have demonstrated that the checklist significantly reduces postoperative complications, enhances team communication, and improves patient outcomes[5,6]. However, despite widespread endorsement and evidence of its effectiveness, consistent and comprehensive implementation remains suboptimal in many healthcare institutions, particularly in low- and middle-income countries[7]. This study investigates the level

of adherence to the WHO Surgical Safety Checklist in a private hospital in Port Harcourt, Nigeria.
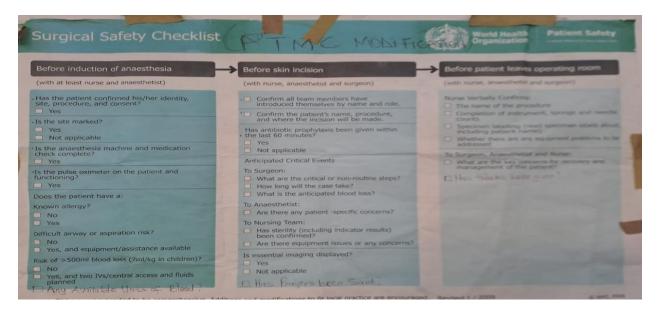
METHODOLOGY

A retrospective cross-sectional approach was adopted in a private tertiary hospital located in Port Harcourt. The study focused on surgical procedures conducted in the main theatre complex, covering both elective and emergency cases. Data sources included 157 systematically sampled surgeries over a four-year period, of which only cases with fully completed checklists were included. In addition to checklist review, real-time observations of selected surgical procedures were conducted to evaluate the fidelity of checklist application. Procedures performed under local infiltration (e.g., orchidectomies) were typically excluded from checklist use and not included in analysis. The study population comprised members of the surgical team including nurses, anaesthetists, and surgeons. Ethical clearance was obtained from the hospital's ethics committee. Data confidentiality and anonymity were strictly maintained. Analysis was conducted using IBM SPSS version 25, applying descriptive statistics and chi-square tests to identify associations at a 95% confidence interval ($p < 0.05$).

RESULTS

Table 1: Demographic Characteristics of Participants

Characteristic	Frequency (n=86)	Percentage (%)
Female	53	62%
Male	33	38%
Age 18-30	32	37%
Age 31-40	28	33%
Age 41-50	19	22%
Age 51 and above	7	8%
Nurses	52	61%
Surgeons	21	24%
Anesthesiologists	12	14%

The majority of respondents were female nurses aged between 18–30 years. Anaesthesiologists and surgeons constituted 14% and 24%, respectively, reflecting a typical operating theatre team composition in the setting.

The World Health Organization (WHO) Surgical Safety Checklist is a globally endorsed tool designed to enhance surgical safety through structured communication, risk assessment, and coordinated teamwork among surgical teams. This particular version, modified for use in a private hospital setting, follows the standard tripartite structure of the checklist but reflects local adaptations and cultural sensitivities. The checklist is divided into three key phases corresponding with

the natural flow of a surgical procedure: before the induction of anaesthesia, before the skin incision, and before the patient leaves the operating room. Each stage serves a distinct purpose and is jointly administered by a team of healthcare professionals, typically including the nurse, anaesthetist, and surgeon.

The first phase, occurring before anaesthesia is administered, is primarily focused on patient verification and readiness for surgery. At this stage, essential checks are performed to confirm the patient's identity, the planned procedure, the surgical site, and whether informed consent has been duly obtained. These steps are foundational in eliminating common and preventable errors such as wrong-patient or wrong-site surgeries. The checklist also prompts confirmation that the anaesthesia machine is in proper working order and that medication checks are complete, underscoring the importance of technical preparedness. Equally vital is the verification of the pulse oximeter's functionality, which is critical for continuous monitoring of the patient's oxygen saturation during the procedure.

A significant aspect of this phase includes an assessment of patient-specific risks. These include known allergies, potential airway difficulties, aspiration risks, and anticipated blood loss, particularly if it exceeds 500ml (or 7ml/kg in children). In the event of anticipated significant blood loss, preparations such as the availability of IV access, fluid replacement, and blood units are crucial. Interestingly, handwritten annotations such as "Any available units of blood?" on the form indicate a heightened institutional awareness of the risks associated with haemorrhage and the importance of transfusion readiness.

The second phase, occurring just before the skin is incised, centres on the coordination and alignment of the surgical team. All members are required to introduce themselves by name and role, which, although seemingly simple, plays a powerful role in improving communication and accountability. This phase also involves reconfirmation of the patient, the procedure, and the site, further reinforcing the safeguards initiated in the first phase. Another vital component is the verification of antibiotic administration within the previous 60 minutes, which is a well-established measure to reduce surgical site infections.

Crucially, this stage encourages open discussion of the surgical plan, anticipated critical events, and individual concerns. The surgeon outlines the expected course of the procedure, potential complications, and the estimated blood loss. Simultaneously, the anaesthetist highlights any patient-specific concerns such as comorbidities or anaesthesia-related risks, while the nursing staff confirms that sterility protocols have been followed and that all essential equipment is available and functional. The checklist even includes a prompt for ensuring that any required imaging is displayed. Notably, the handwritten addition, "Has prayers been said?" reflects a local cultural practice, suggesting the incorporation of spirituality as a comfort mechanism or ritual for the surgical team and patient alike.

The final phase of the checklist is implemented before the patient leaves the operating room. This stage ensures that all procedural and post-procedural tasks have been completed accurately. The nurse verbally confirms the procedure performed, completion of instrument and sponge counts, and proper labelling of any specimens collected. This serves as a final quality control measure to prevent retained surgical items and specimen mix-ups. Additionally, the team collectively reviews and confirms any concerns relevant to post-operative care and patient recovery, ensuring continuity of care as the patient transitions from the operating theatre to recovery or the ward. Another local adaptation, the handwritten phrase "Has thanks been given?", may symbolise gratitude among the team for a successful surgery or perhaps a moment of reflection—underscoring a humanistic dimension within the clinical process.

Table 2: Awareness and training on the WHO Checklist

Awareness Level	Frequency (n=86)	Percentage (%)
Aware of checklist	76	88%
Fully understand checklist	68	79%
Received formal training	60	70%

While awareness and basic understanding of the checklist were high, gaps remain in formal training—an essential component for consistent application.

Table 3: Adherence to key Checklist Items

Checklist Item	Frequency (n=86)	Adherence (%)
Patient identity verification	85	98%
Surgical site marking	63	73%
Confirmation of procedure	50	85%
Antibiotic prophylaxis	69	80%
Sign Out verification	56	65%

The highest compliance was observed in identity verification. Lower adherence in Sign Out procedures and site marking suggest areas for targeted improvement.

DISCUSSION

The findings of this study present a nuanced perspective on the implementation and perceived utility of the World Health Organization (WHO) Surgical Safety Checklist in a private hospital in Port Harcourt. Notably, the level of awareness among operating theatre staff was remarkably high, with 88% of respondents confirming familiarity with the checklist. This aligns closely with studies by Olatosi et al., who reported a 93.1% awareness level among physician anaesthetists in Nigeria[15], and Delgado Hurtado et al., who recorded a 93.8% awareness rate among surgical teams in Latin America as cited in Ogunusi et al.[15]. A similar trend was documented in Switzerland, where high awareness among surgical teams demonstrated a growing global consensus on the checklist's relevance as a patient safety tool[2,11].

However, while awareness is commendably high, the study brings to light a critical discrepancy between awareness and actual practice. Full checklist utilisation was reported by 78% of respondents, suggesting that a significant minority (22%) do not consistently apply the checklist. This inconsistency in practice echoes concerns raised in other studies, where high awareness did not necessarily equate to rigorous implementation[3,6,13]. Several contributing factors have been cited in the literature, including time constraints, hierarchical dynamics within surgical teams, and a lack of institutional enforcement mechanisms[4,5,10].

Adherence to individual components of the checklist also varied markedly. In this study, verification of patient identity and surgical procedure saw the highest compliance rate (98%), a finding that surpasses the 93.1% adherence level previously documented by Olatosi et al.[15]. This high rate may reflect greater institutional emphasis on preoperative verification, possibly driven by medico-legal considerations. However, adherence to surgical site marking was lower (73%), and compliance with the Sign Out phase was the lowest at 65%. These latter figures underscore a persistent global issue: while the initial phases of the checklist—namely the Sign In and Time Out—are more likely to be completed due to their visibility and perceived importance, the final Sign Out phase is often neglected[7,11,13].

This trend was identified in the work of Russ et al., who categorised Sign Out as the most underutilised phase due to poor workflow integration and lack of perceived relevance[1,3]. Similarly, Bartz-Kurycki et al. described the Sign Out phase as the "forgotten component" of the surgical safety checklist, despite its critical role in ensuring proper instrument counts, specimen labelling, and review of any intraoperative issues[13]. The present study's findings corroborate these insights, suggesting that institutional culture and workflow design may prioritise early-phase compliance while neglecting the final critical checks[9].

Regarding perceived benefits, 85% of respondents agreed that the checklist improves communication and teamwork. This aligns with Ziman et al., who reported a 90.2% agreement among staff that the checklist enhances intraoperative coordination[8]. Singer et al. further demonstrated that improved communication resulting from checklist implementation positively correlates with surgical outcomes and team dynamics[18]. Effective communication is central to fostering a safety culture in the operating room, reducing cognitive errors, and supporting timely decision-making[12,16].

Despite these positive perceptions, institutional commitment to checklist enforcement appears insufficient. Only 55% of participants reported the existence of active enforcement mechanisms. This indicates that, although staff may be motivated and knowledgeable, systemic limitations hinder consistent adherence. This finding is consistent with prior research by Fourcade et al. and Sendlhofer et al., who highlighted that lack of administrative support, inadequate training, and staff resistance to perceived bureaucracy are significant barriers to sustainable checklist implementation[4,5]. Furthermore, checklist fatigue—a condition where repetitive procedural tasks are devalued or skipped—can also impede proper execution[7,13].

The study recommed (i) integrating the checklist into electronic medical records to enhance real-time usability, (ii) performing regular audits and feedback sessions to sustain compliance, (iii) involving all surgical team members in checklist briefings to foster collective ownership, and (iv) ensuring senior staff actively model checklist adherence[4,7,17]. These interventions not only enhance checklist compliance but also contribute to the creation of a robust safety culture, where patient welfare is prioritised over procedural expediency[17].

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