Original Research | TORGJ | Volume 2 Issue 2 | Special Issue | 2026

DOI: https://doi.org/10.64573/torgj2601002

The Operating Room Global Journal (TORGJ)

https://torgjournal.org/

ISSN: 3105-3262

Perception and Involvement of Operating Room Professionals in the Use of the Surgical Safety Checklist: A Cross-Sectional Study in Cameroon

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Declaration:
Authors' Contribution: Equal contributions
Conflict of Interest: No conflict of interest.
Funding: This research received no specific grant from any public, commercial, or not-for-profit funding agency.

Article History:
Received: 23-01-2026
Accepted: 02-04-2026
Available Online: 09-04-2026

QR access this Article

ABSTRACT

Background: The WHO Surgical Safety Checklist (SSC) is a simple, low-cost tool that has been shown to save lives in operating rooms around the world. Yet knowing about a checklist and actually using it well during a stressful surgery are two very different things. In Cameroon, as in many resource-limited settings, the gap between what teams know in theory and what they do in practice remains a real challenge.

Methods: Between March and June 2025, we conducted a cross-sectional study in the operating theatres of two referral hospitals in Yaoundé. Forty-one surgical team members completed a structured questionnaire. In parallel, a trained observer silently watched 25 actual surgical procedures to document exactly how and how fully the checklist was being used in real time.

Results: The great majority of participants (85%) could accurately describe the checklist, and every single one agreed that it improves patient safety. Yet nearly half (46%) found it burdensome, and almost three-quarters (73%) struggled to use it during emergencies. When we watched actual surgeries, the picture became clearer: roughly 60% of checklists were executed incompletely or only on paper. Adherence was best during the Sign-In phase (78%), dropped noticeably during Time-Out (52%), and fell furthest during Sign-Out (41%).

Conclusion: Surgical teams in Yaoundé understand the value of the WHO checklist. What is missing is not awareness but consistent, meaningful practice. Closing this gap will require visible leadership from senior clinicians, hands-on team training especially for emergency scenarios and an effort to weave the checklist into the natural rhythm of daily surgical work rather than treating it as an added formality.

Keywords: *Cameroon; Operating Room; Patient Safety; Quality Improvement; Surgical Safety Checklist.*

INTRODUCTION

Every day, surgeons, anaesthetists, and nurses around the world perform hundreds of millions of procedures in the hope of healing their patients. Yet surgery, by its very nature, carries risk. Between 234 and 313 million major operations are performed globally each year [1, 2], and complications occur in as many as 16% of cases. Perioperative death rates range from 0.4% to 10% a burden that falls most heavily on low- and middle-income countries (LMICs) [1, 3]. What makes this figure particularly painful is that research consistently shows at least half of these adverse outcomes are preventable. Communication failures, human error, and organisational breakdowns in high-pressure operating rooms are frequently to blame [4, 5].

In Africa, the picture is even more stark: patients face roughly twice the risk of dying after surgery compared to the global average [6]. This is not simply a matter of surgical skill. It reflects deeper gaps in systems, resources, and safety culture. In 2008, the World Health Organization responded to this crisis with its "Safe Surgery Saves Lives" campaign. At its heart was a deceptively simple tool: the Surgical Safety Checklist (SSC). Modelled on the checklists pilots use before take-off, the 19-item SSC prompts teams to pause at three moments Sign-In (before anaesthesia), Time-Out (before the first incision), and Sign-Out (before the patient leaves the theatre) to confirm that nothing critical has been missed [7, 8].

The evidence for this tool is compelling. A landmark study in the New England Journal of Medicine showed that introducing the SSC cut postoperative complications from 11% to 7% and mortality from 1.5% to 0.8% across diverse hospitals worldwide [3]. Subsequent reviews have confirmed these gains: fewer infections, fewer unplanned returns to theatre, and lower in-hospital death rates [9, 10]. And beyond the numbers, the SSC does something harder to measure, it gives every member of the team regardless of seniority a legitimate voice in the room [11].

Despite all of this, high-fidelity implementation remains elusive. Researchers have labelled this the "implementation gap" the distance between what a tool can achieve in principle and what it actually achieves in daily practice [12]. In LMICs, this gap is driven by resource constraints, hierarchical cultures that discourage junior staff from speaking up, and insufficient institutional support [13, 14]. Studies across Africa have found inconsistent use, with barriers including a lack of surgeon ownership, inadequate training, and a widespread perception that the checklist is simply paperwork [15, 16].

Cameroon has made national-level efforts to address this, including a structured programme for SSC implementation described in the literature [17]. But national programmes depend ultimately on what happens in individual operating theatres, in the hands of individual teams, on any given day. There is currently little detailed, locally grounded evidence about how professionals in Cameroonian hospitals actually perceive and experience the checklist in their daily work. This study was designed to fill that gap. Working in two referral hospitals in Yaoundé, we set out to understand not just what teams know about the SSC, but what they think of it and whether that translates into how they actually use it.

METHODS

Study Design and Setting

This was a descriptive cross-sectional study conducted between March and June 2025 in the operating rooms of two referral hospitals in Yaoundé: the Military Hospital of Region 1, a major public facility, and Bethesda Hospital, a private faith-based institution. These two sites were deliberately chosen to capture a broader range of surgical contexts one representing the public sector, the other the private both performing a mix of elective and emergency procedures throughout the week.

Study Population and Sampling

We invited all healthcare professionals actively working in the operating rooms of both hospitals during the study period to participate. This included surgeons, physician anaesthetists, nurse anaesthetists, scrub nurses, and assistant operating room staff. We used convenience sampling anyone eligible and willing during data collection was included. To be eligible, participants needed to be a regular or rotating member of the surgical team and to give their informed consent. We excluded administrative staff and students on brief observation placements, as they are not directly involved in intraoperative care.

Data Collection

We used two complementary approaches. The first was a structured self-administered questionnaire; the second was direct, non-participant observation of real surgical cases. Together, these allowed us to compare what professionals reported believing and doing with what was actually happening in the theatre.

- **Questionnaire**

The questionnaire was developed based on a review of existing literature on SSC implementation and perception [15, 16] and was written in French, the working language of both hospitals. It covered four areas: sociodemographic and professional background (age, sex, role, years of experience); knowledge of the SSC (its definition, objectives, and three phases); perceptions of the checklist (attitudes toward its usefulness, its impact on teamwork, and its practical drawbacks); and barriers and facilitators in daily use. Before deployment, the questionnaire was piloted with five operating room professionals from a non-participating hospital to ensure clarity and relevance.

- **Direct Observation**

A single trained investigator observed 25 surgical procedures both elective and emergency cases without participating in the care. The observer had been trained on the WHO SSC using the official implementation manual [7, 17] before data collection began. For each case, a structured observation grid was used to document whether each checklist item was fully executed with active verbal confirmation, partially executed, or omitted entirely. While we cannot fully eliminate the possibility that being watched changed team behaviour, the observer maintained a discreet position in the theatre and did not interact with staff during procedures.

Data Analysis

Questionnaire and observation data were entered and analysed using Sphinx Plus V5 and Microsoft Excel 2016. We used descriptive statistics throughout, presenting categorical variables as frequencies and percentages. The self-reported findings were then triangulated with the observational data a step that proved especially revealing, as the two sources told rather different stories.

Ethical Considerations

The study received ethical approval from the institutional review boards of both participating hospitals. All participants received a clear explanation of the study's purpose before being asked to consent. For the observational component, consent was obtained from the head of surgery and the lead surgeon for each observed case. All data were anonymised and stored securely. Participation was entirely voluntary, with no incentives offered.

RESULTS

Sociodemographic and Professional Characteristics of Participants

Forty-one operating room professionals completed the questionnaire. The group was almost evenly split by sex: 21 men (51%) and 20 women (49%). In terms of professional role, nurse anaesthetists were the largest group (n=12, 29%), followed by operating room nurses (n=11, 27%), with surgeons and assistant operating room staff each accounting for 22% (n=9). Most participants had several years of experience working in surgical environments.

Table 1: Characteristics of respondents

Variable	n	%
Sex		
Male	21	51
Female	20	49
Professional Category		
Nurse Anesthetist	12	29
Operating Room Nurse	11	27
Surgeon	9	22
Assistant Operating Room Staff	9	22

What Professionals Know About the SSC

On paper, knowledge levels were high. Thirty-five participants (85%) could give a correct definition of the SSC, and every single one all 41 acknowledged that its primary objectives are to improve patient safety and reduce surgical errors. There was one notable gap, however: only 71% (n=29) could correctly identify and describe all three execution phases in the right sequence. That means roughly one in four team members was uncertain about the structure of the very tool they are expected to lead.

Table 2: Knowledge of the Surgical Safety Checklist

Knowledge Item	n	%
Correctly defined the SSC	35	85
Acknowledged the objectives of the SSC (improve safety, reduce errors)	41	100
Correctly identified all three execution phases	29	71

Perception of the Surgical Safety Checklist

Perception of the SSC was overwhelmingly positive in principle. All respondents (100%) agreed that the checklist improves patient safety and helps prevent surgical errors. A large majority (78%) also recognized its value in improving communication within the surgical team. However, this positive view was tempered by practical concerns. Nearly half of the participants (n=19, 46%) perceived the checklist as an additional administrative burden that added to their workload. Furthermore, a significant proportion (n=30, 73%) reported that using the checklist was difficult to apply correctly and consistently during emergency procedures, where time pressure is a major factor. Table 3 details these perceptions.

Table 3: Perception of the Surgical Safety Checklist

Perception Statement	Agree (%)
Improves patient safety	100
Prevents surgical errors	100
Improves team communication	78
Is considered an additional administrative burden	46
Is difficult to apply in emergencies	73

Professional Involvement and Observed Execution of the Checklist

This is where the study's most telling findings emerge. When we stepped into the operating rooms and watched, the picture shifted considerably from what questionnaire responses suggested. Across all 25 observed procedures, roughly 60% of checklists were poorly executed meaning items were skipped, completed without any real team engagement, or ticked off almost as a reflex rather than a genuine shared check. The quality of execution also varied markedly depending on which phase of the checklist was being performed.

The Sign-In phase, conducted before anaesthesia induction and typically carried out by the nurse and anaesthetist, was the most reliably completed, with 78% of its items correctly executed. It focuses on patient identity, consent, and anaesthesia safety checks tasks that are well rehearsed and do not require the whole team to stop. The Time-Out phase the critical pause that must happen just before the first incision, with the entire team present showed a sharp drop in compliance: only 52% of items were correctly executed. This is the moment that requires everyone in the room to pause, speak, and listen. In practice, it was frequently rushed, partially completed, or quietly skipped, especially during busy lists.

The Sign-Out phase, intended to close the procedure safely before the patient leaves the theatre, had the lowest compliance of all: just 41%. These observational findings are summarized in Table 4.

Table 4: Observed compliance with the WHO Surgical Safety Checklist by phase

Checklist Phase	Correctly Executed (%)
Sign-In (before anesthesia)	78
Time-Out (before incision)	52
Sign-Out (before leaving OR)	41

DISCUSSION OF FINDINGS

This study set out to understand the WHO Surgical Safety Checklist from the inside not just as a policy instrument, but as something that real people in real operating theatres in Yaoundé choose to use, half-use, or quietly set aside. By combining what professionals told us with what we actually observed, a nuanced and at times uncomfortable picture emerged.

Positive perception but limited translation into practice

The near-universal theoretical endorsement of the SSC among our participants is consistent with what studies from other parts of the world have found [11, 16]. Nobody in our study rejected the checklist's value. All 41 participants agreed it improves patient safety. By conventional measures of awareness, this could be declared a success.

And yet, when we watched those same teams work, roughly 60% of checklists were incomplete or superficial. This is one of the clearest illustrations we have seen in our local context of what the literature calls the "implementation gap" [12, 14] the persistent distance between knowing something matters and actually doing it consistently. In the rooms we observed, the checklist had often become a formality: boxes ticked, words said by rote, but without the shared attention and communication that give it meaning.

Variability in compliance across checklist phases

The progressive drop in compliance across the three phases from 78% at Sign-In to 41% at Sign-Out is not random. It maps directly onto what each phase demands of the team. Sign-In is a focused, bilateral interaction: a nurse and an anaesthetist confirming technical information before a third person has entered the room. It requires care but not collective disruption. Time-Out and Sign-Out are different. They require the entire team to stop simultaneously, speak openly, and in the case of Time-Out introduce themselves and discuss what could go wrong. These are the phases most dependent on psychological safety, on a team culture where junior staff feel entitled to speak, and on senior clinicians who actively lead rather than passively observe [8, 18].In the settings we observed, those conditions were inconsistently present. The Time-Out, in particular, was frequently rushed or incomplete especially during emergency cases or when operating lists were long. This is deeply concerning, because emergencies are precisely the moments when structured communication can prevent fatal errors [5].

Perceived barriers and contextual constraints

The 73% of participants who said the checklist is hard to use in emergencies are not making excuses. They are describing something real about operating rooms in resource-limited settings: understaffing, high case volumes, and constant pressure to move quickly [13, 15]. When the next patient is already waiting and the team is tired, a safety protocol that requires everyone to stop, speak, and listen can feel like a luxury rather than a necessity.

This perception that the checklist interrupts rather than supports the work is one of the most important barriers to address. It will not be resolved by posters on the wall or a single training session. It requires the checklist to be experienced, repeatedly, as something that fits the rhythm of surgical work rather than standing apart from it.

Team dynamics, hierarchy, and leadership engagement

The low compliance during Time-Out and Sign-Out phases also reflects a deeper structural reality in many African operating rooms: professional hierarchy. When the most senior surgeon in the room does not initiate or visibly endorse the checklist, the message that reaches junior staff is clear this is optional [15, 16].

Qualitative studies in sub-Saharan Africa have documented how difficult it is for nurses, in particular, to insist on checklist completion when surgeons have not themselves committed to it [16]. In our observational data, leadership during checklist execution was inconsistent across sites, with the phases requiring collective participation being the most frequently short-changed. Senior engagement is not a nice-to-have; it is the foundation on which everything else rests.

The Absence of Feedback Loops

One thread that runs through all of these findings is the absence of accountability. When checklist completion is not monitored, when omissions go unnoticed, and when no one reviews compliance data with the team, there is no mechanism to improve. The literature is consistent on this point: sustained gains in SSC use require institutional structures regular audits, feedback to teams, local champions who champion the tool not as a bureaucratic requirement but as a genuine safety practice [17, 19].

Without these structures, initial improvements tend to fade. What we observed in several of our cases checklist completion that looked more like a ritual than a real check is a well-documented endpoint of implementation without reinforcement, sometimes called the "tick-box" problem.

Placing These Findings in the Cameroonian Context

The national-level work on SSC implementation in Cameroon, notably the multi-component strategy described by White et al. [17], demonstrated that meaningful gains in checklist penetration are achievable through structured, supported programmes. Our findings do not contradict this. They complement it by showing what happens on the ground, in individual theatres, once that initial push has passed.

There is also a methodological point worth making. Self-reported data questionnaires like ours consistently overestimate actual compliance. Direct observation gives a more honest reading. The gap between what our participants said they did and what we watched them do underscores why mixed-method approaches are not merely a methodological preference but a practical necessity for anyone trying to understand SSC implementation realistically.

IMPLICATIONS FOR PRACTICE

Taken together, these findings point toward a set of concrete, context-sensitive actions. Team-based and simulation training focused specifically on emergency scenarios could help normalise checklist use under pressure. Explicit, visible leadership from senior surgeons who lead the Time-Out and Sign-Out with the same care they bring to the operation itself would change the cultural message. Regular, non-punitive feedback to teams about their checklist performance would close the accountability loop. And embedding the SSC into standard operating procedures making it part of how surgery works here, not an imported add-on would give it the relevance and staying power it currently lacks.

CONCLUSION

Operating room professionals in this study view the World Health Organization Surgical Safety Checklist as a valuable and essential tool for patient safety. However, this positive perception does not consistently translate into rigorous daily practice. In reality, its use remains uneven and is sometimes reduced to a mere formality, particularly during the critical Time-Out and Sign-Out phases. This gap is not coincidental. It reflects both structural and behavioral constraints: persistent time pressure in the operating room, entrenched hierarchical relationships that limit open communication, the perception of the checklist as an additional administrative burden, and a lack of strong institutional support. Bridging this gap requires more than simple awareness—it calls for a genuine change in practice. The checklist must be fully integrated into routine surgical workflows rather than treated as an optional add-on. Training approaches should move beyond theory and prioritize practical, simulation-based learning grounded in real operating room conditions. At the same time, teams must foster an environment of psychological safety, where every member, regardless of status, feels empowered to speak up.

DECLARATIONS

Authors' Contribution

All authors contributed equally to the conception and design of the study, data collection, analysis and interpretation of results, and the drafting and final approval of the manuscript.

Conflict of Interest

The authors declare no conflict of interest.

Funding

This research received no specific grant from any public, commercial, or not-for-profit funding agency.

AI Use Declaration

Artificial intelligence tools were used solely for language editing and grammatical support during manuscript preparation. No AI tools were used for data generation, data analysis, interpretation of results, or substantive content creation. The authors take full responsibility for the manuscript's content.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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CITE THIS ARTICLE:

APA (7th edition): Ngaroua, Djibrilla, Y., Fadimatou, A., Mafouo, E. A., & Ngah, J. E. (2026, April 9). Perception and involvement of operating room professionals in the use of the surgical safety checklist: A cross-sectional study in Cameroon. The Operating Room Global Journal (TORGJ), 2(1). https://doi.org/10.64573/torgj2601002

Harvard: Ngaroua, Djibrilla, Y., Fadimatou, A., Mafouo, E.A. and Ngah, J.E., 2026. Perception and involvement of operating room professionals in the use of the surgical safety checklist: A cross-sectional study in Cameroon. The Operating Room Global Journal (TORGJ), 2(1). Published 9 April. Available at: https://doi.org/10.64573/torgj2601002

Vancouver: Ngaroua, Djibrilla Y, Fadimatou A, Mafouo EA, Ngah JE. Perception and involvement of operating room professionals in the use of the surgical safety checklist: A cross-sectional study in Cameroon. The Operating Room Global Journal (TORGJ). 2026 Apr 9;2(1). https://doi.org/10.64573/torgj2601002

MLA (9th edition): Ngaroua, et al. "Perception and Involvement of Operating Room Professionals in the Use of the Surgical Safety Checklist: A Cross-Sectional Study in Cameroon." The Operating Room Global Journal (TORGJ), vol. 2, no. 1, 9 Apr. 2026, https://doi.org/10.64573/torgj2601002

Chicago (Author-Date): Ngaroua, Yaouba Djibrilla, Altine Fadimatou, Elvira Awagning Mafouo, and Joseph Eloundou Ngah. 2026. "Perception and Involvement of Operating Room Professionals in the Use of the Surgical Safety Checklist: A Cross-Sectional Study in Cameroon." The Operating Room Global Journal (TORGJ) 2 (1), April 9. https://doi.org/10.64573/torgj2601002