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Assessing Compliance, Completeness, And Contributing Factors of Postoperative Handover Practices in Post-Anesthesia Care Units in Rwanda: A Cross-Sectional Observational Study

Eric KWIZERA

erickwizera450@gmail.com

King Faisal Hospital Rwanda

Abraham Worl kiir

Marial Lou Hospital

jean pierre FATAKANWA

KIBAGABAGA L2 TEACHING HOSPITAL

Jean Leonard TURABAYO

University of Rwanda

Assoumpta YAMURAGIYE

University of Rwanda

Marie Grace Sandra MUSABWASONI

University of Rwanda

Salomon IZERE

University of Rwanda

Jackson KWIZERA NDEKEZI

King Faisal Hospital Rwanda

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Abstract

Background

Effective postoperative handover in the post-anesthesia care unit (PACU) is essential for patient safety and continuity of care. However, in many healthcare settings, particularly in resource-constrained environments, this process remains incomplete and unstructured. This study assessed postoperative handover practices among theatre teams at two district hospitals in Kigali, Rwanda, focusing on compliance with the SBAR (Situation, Background, Assessment, Recommendation) framework, completeness of information transfer, and contributing factors.

Methods

A cross-sectional observational study was conducted at Kibagabaga Level II Teaching Hospital and Kacyiru District Hospital between February and May 2025. A total of 130 postoperative handovers were directly observed using a structured checklist adapted from the Postoperative Handover Assessment Tool (PoHAT) and based on the SBAR protocol. Data were analyzed using SPSS version 27.0 and Microsoft Excel. Descriptive statistics, chi-square tests, and Pearson correlation analysis were employed to assess handover completeness and identify associated factors. Statistical significance was set at $p < 0.05$.

Results

Anesthetists initiated 72.3% of handovers; midwives (55.4%) and nurses (44.6%) were primary recipients. Most handovers occurred within 10 minutes of patient arrival (73.1%) and lasted less than 5 minutes (77.7%). The Situation component was complete in 68.5% of handovers; ASA classification was reported in only 33.8%. In the Background domain, type of anesthesia (92.3%) and surgical procedure (90.0%) were frequently communicated, while allergy history (46.2%) and intraoperative events (56.2%) were often omitted. Airway status (20.0%) and intraoperative findings (19.2%) were the least reported Assessment elements. Discharge criteria were communicated in only 13.8% of handovers. The absence of a structured handover protocol was universal (100%), and multitasking was observed in 67.7% of handovers. Multitasking showed a significant negative correlation with SBAR completeness ($r = -0.405$, $p < 0.001$) and a significant association with procedural failures (chi-square = 16.277, $p < 0.001$).

Conclusions

Critical information was frequently omitted during postoperative handovers at two district hospitals in Rwanda. The complete absence of structured protocols and high prevalence of multitasking significantly

compromised handover quality. Implementing standardized SBAR-based handover protocols, reducing multitasking, and targeted training are essential to improve handover completeness and patient safety.

BACKGROUND

Postoperative handover in the post-anesthesia care unit (PACU) is a critical transition point in the continuum of patient care. It involves the systematic transfer of clinical information, responsibility, and accountability from the operating theatre team to the PACU staff following surgery and anesthesia (1). This process ensures that receiving healthcare providers are equipped with the knowledge necessary to monitor, manage, and intervene in the immediate postoperative period, thereby safeguarding patient safety and continuity of care (2).

A well-conducted handover is fundamental to an effective healthcare system and stands alongside patient clinical documentation, referral letters, and discharge summaries as an essential link in the chain of continuity of care (2). Handover requires systemic and individual attention, including education, support, facilitation, and sustained effort to maintain its position of importance in an already demanding clinical environment (3). However, reporting patient information among healthcare providers remains challenging worldwide. In the Meuse-Rhine Euregion in Europe, healthcare workers report difficulties with information exchange, procedural variations, and role clarification across health systems, with many providers inadequately trained for interprofessional handovers (4). These challenges are echoed globally, where differing healthcare standards, lack of shared information systems, and minimal mutual understanding contribute to information loss and delays (4). A French study demonstrated that implementing a standardized handover checklist in the PACU significantly reduced hypoxemic events and improved the quality of information transfer (5).

Structured handover protocols, including checklists and standardized communication tools, have been shown to significantly improve the quality and completeness of information exchange between anesthesia and PACU teams (6). Standardizing handover processes in the PACU has been associated with improved patient outcomes by reducing information omissions and increasing consistency (2). The Situation, Background, Assessment, Recommendation (SBAR) framework is one such tool that provides a common language for communicating key patient care information, reducing errors in communication between health workers, and enhancing patient safety (7). Despite this evidence, adoption of structured handover processes remains limited in many hospitals (8). Barriers to implementing structured protocols include limited training on standardized communication methods and resistance to adopting new processes (9).

In Africa, a study conducted at Muhimbili Orthopedic Institute Hospital in Tanzania revealed that 31.7% of postoperative handovers were poorly communicated (10). In Ethiopia, a cross-sectional study at Dilla University Referral Hospital found that ASA classification was transferred in only 4.3% of cases, and intraoperative blood loss was mentioned in only 9.6% of handovers (11). These findings underscore a

broader pattern in which essential intraoperative information is neglected, potentially compromising patient safety and continuity of care.

In Rwanda, a study at the University Teaching Hospital of Butare (CHUB) found that most essential patient information was completed in less than 60% of postoperative handover reports (12). This underperformance not only undermines the quality of postoperative handover but also poses significant risks to patient safety, including poor management of postoperative complications. The World Health Organization (WHO) recommends the use of a standardized checklist for handover practice and one-to-one observation of every patient in the recovery room (13). Several factors influence handover effectiveness in PACU settings, including variability in communication styles, time constraints, inadequate training, and the lack of standardized protocols (14).

To date, no research has been conducted at Kibagabaga Level II Teaching Hospital or Kacyiru District Hospital to explore handover practices among theatre teams. Furthermore, there is no available evidence on factors that may influence handover practices at these institutions. This study therefore aimed to assess the current state of postoperative handover practices, focusing on compliance with SBAR components, completeness of information transfer, and contributing factors, in order to provide actionable evidence for improving handover quality and patient safety.

METHODS

Study design and setting

A cross-sectional observational study was conducted at Kibagabaga Level II Teaching Hospital and Kacyiru District Hospital, both located in Kigali, Rwanda, between February 19 and May 19, 2025. A cross-sectional design was deemed appropriate as the study aimed to capture the existing state of handover practices at a single point in time without introducing any intervention. Kibagabaga Level II Teaching Hospital is a district-level teaching facility providing five specialized surgical services, including obstetrics and gynecology, ophthalmology, ear, nose, and throat (ENT), orthopedics, and general surgery, with a post-anesthesia care unit (PACU) capacity of 11 beds. Kacyiru District Hospital is a secondary-level facility providing obstetric and gynecological surgical interventions, with a PACU capacity of 10 beds. Both hospitals are staffed with surgical and post-surgical care professionals, enabling an effective assessment of handover practices across two levels of the Rwandan healthcare system.

Study population, sampling, and sample size

The study population comprised perioperative team members involved in postoperative handover in the PACU, including anesthetists, anesthesiologists, nurses, midwives, and surgeons; the latter included surgically trained personnel and general practitioners. Each handover procedure was considered a unit of observation. A convenience sampling method was employed, whereby handover processes were observed as they occurred in the PACU during scheduled data collection days.

The sample size was determined using Taro Yamane's formula (15): n = N / (1 + N(e)^2), where n is the sample size, N is the target population, and e is the margin of error. Based on a target population of 193 postoperative handovers across the two hospitals during the study period, a 5% margin of error, and a 95% confidence level, the calculated sample size was 130 handovers. Data were collected during a single day shift per week, excluding weekends, to ensure consistency in observation conditions. The maximum number of case transitions at Kibagabaga Level II Teaching Hospital ranged from 7 to 9 per day, while Kacyiru District Hospital had 6 to 7 cases per day.

Inclusion and exclusion criteria

The study included all handover procedures conducted in the PACU by anesthesia providers, nurses, midwives, or surgeons responsible for patient care, with a minimum of six months of clinical experience. Handover procedures conducted outside the PACU and those performed by interns, visiting staff, and students in training under supervision were excluded. Non-clinical staff not involved in the handover process were also excluded.

Data collection instrument

Data were collected through structured direct observation of handover practices using a checklist based on the SBAR (Situation, Background, Assessment, Recommendation) protocol. The observational checklist was adapted from the Postoperative Handover Assessment Tool (PoHAT) developed by Nagpal et al. (16). The PoHAT was developed through task analysis, semistructured interviews, literature review, and learned society guidelines, and was subsequently validated using the Delphi technique. It has demonstrated excellent inter-rater reliability ($r = 0.96$, $p < 0.001$) and feasibility for assessing postoperative handover quality in observational settings (16).

The adapted checklist was used to assess the current state of handover practice, including timing, content, quality, and completeness across the four SBAR domains:

- - Situation: patient name, age, gender, current issue, vital signs, ASA classification.
- - Background: type of anesthesia, surgical procedure, diagnosis, intraoperative events, medications administered, allergy history, medical history, surgical history, anesthesia history.
- - Assessment: general status, pain level, intraoperative findings, airway status, fluid status.
- - Recommendation: postoperative plan, further action, discharge criteria.

Each item was scored as present 1 or absent 0. A domain was considered complete if all items within that domain were reported. An overall SBAR completeness score was calculated as the sum of all items reported across the four domains.

Contributing factors, including the absence of a structured protocol, multitasking, interruptions, insufficient time, handover space, handover materials, and clarity of report, were also recorded for each

observed handover.

Data collection procedure

Data were collected by the research team, who observed handover processes in real time without interfering with clinical activities. Observations were conducted during scheduled surgical days at each hospital. The observers completed the checklist immediately after each handover to minimize recall bias. No feedback was provided to the clinical staff during the observation period to avoid altering their natural handover behavior.

Data analysis

Data were analyzed using SPSS version 27.0 (IBM Corp., Armonk, NY, USA) and Microsoft Excel (Microsoft Corporation, Redmond, WA, USA). Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the data. The chi-square test was employed to determine associations between contributing factors and handover outcomes, with statistical significance set at $p < 0.05$. Pearson correlation analysis was conducted to assess the relationships between SBAR completeness scores and contributing factors. Odds ratios (OR) were calculated to estimate the strength of associations between contributing factors and incomplete handover outcomes.

Ethical considerations

Ethical approval

was obtained from the Institutional Review Board of the University of Rwanda, College of Medicine and Health Sciences (Ref: CMHS/IRB/032/2025), and ethical clearance was granted by the administrations of both Kibagabaga Level II Teaching Hospital and Kacyiru District Hospital prior to data collection. Written informed consent was obtained from all participating healthcare providers after they were provided with a detailed explanation of the study purpose, procedures, and their right to withdraw at any time without consequence. To maintain patient confidentiality, no patient identifiers were recorded on the observational checklist. Electronic data were stored in a password-protected format, and hard copies were kept in a locked cupboard for a duration of five years.

This study is reported according to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist for cross-sectional studies (17).

RESULTS

A total of 130 postoperative handovers were observed across the two study sites during the study period. The results are presented in the following order: handover initiation and reception, timing and

duration, SBAR component completeness (Situation, Background, Assessment, and Recommendation), contributing factors, and statistical analyses of associations and correlations.

Handover initiation and reception

Anesthetists initiated the majority of handovers (94, 72.3%), followed by nurses (18, 13.8%), while midwives and surgeons each contributed 9 handovers (6.9%). No anesthesiologists participated in handover initiation. On the receiving side, midwives received 72 handovers (55.4%) and nurses received 58 (44.6%). The mean number of handovers initiated per healthcare professional category was 32.5 (standard deviation [SD] = 40.4), and the mean number received was 65.0 (SD = 9.9) (Table 1).

Table 1
Handover initiation, reception, timing, duration, and clarity (N = 130)

Variable	Category	n	%
Handover initiator	Anesthetist	94	72.3
	Nurse	18	13.8
	Midwife	9	6.9
	Surgeon	9	6.9
	Anesthesiologist	0	0.0
Handover receiver	Midwife	72	55.4
	Nurse	58	44.6
Time to handover after surgery	< 5 min	48	36.9
	5–10 min	47	36.2
	10–15 min	26	20.0
	> 15 min	9	6.9
Duration of handover	< 5 min	101	77.7
	5–10 min	26	20.0
	10–15 min	3	2.3
	> 15 min	0	0.0
Clarity of report	Clear and concise	82	63.1
	Not clear and concise	48	36.9

Data are presented as frequency (n) and percentage (%). Percentages may not sum to 100 due to rounding.

Timing and duration of handovers

The majority of postoperative handovers occurred within the first 10 minutes after the patient left the operating room, with 48 (36.9%) taking place within 5 minutes and 47 (36.2%) within 5 to 10 minutes. However, 26 (20.0%) handovers were delayed by 10 to 15 minutes, and 9 (6.9%) occurred after 15 minutes. The duration of handover reports was generally brief: 101 (77.7%) lasted less than 5 minutes, 26 (20.0%) lasted 5 to 10 minutes, and 3 (2.3%) lasted 10 to 15 minutes. No handover exceeded 15 minutes. Overall, 82 handovers (63.1%) were assessed as clear and concise, while 48 (36.9%) lacked clarity (Table 1).

SBAR Situation component

Of the 130 handovers, 89 (68.5%) included a complete Situation report, while 41 (31.5%) were incomplete. Patient names were reported at the highest rate (122, 93.8%), followed by age (104, 80.0%) and gender (103, 79.2%). The most frequently omitted elements were ASA classification, which was reported in only 44 handovers (33.8%), and the patient's current issue, which was not reported in 93 cases (71.5%) (Fig. 1).

SBAR Background component

In the Background domain, the type of anesthesia was the most consistently reported element (120, 92.3%), followed by the surgical procedure (117, 90.0%) and diagnosis (106, 81.5%). Intraoperative events and medications administered were reported at moderate rates (73, 56.2% and 72, 55.4%, respectively). Anesthesia history and surgical history were documented in 66 (50.8%) and 65 (50.0%) of handovers, respectively, while medical history was included in 64 (49.2%). The least reported Background element was patient allergy history, documented in only 60 handovers (46.2%) (Fig. 2).

SBAR Assessment component

The patient's general status was the most frequently reported Assessment element (89, 68.5%), followed by fluid status (87, 66.9%). Pain level was reported in fewer than half of the cases (54, 41.5%). Airway status (26, 20.0%) and intraoperative findings (25, 19.2%) were the least reported Assessment elements (Fig. 3).

SBAR Recommendation component

A postoperative plan was communicated in 75 handovers (57.7%), and further action was recommended in 63 (48.5%). Discharge criteria were communicated in only 18 handovers (13.8%), while the majority (112, 86.2%) lacked clear discharge guidelines from the PACU (Fig. 4).

Contributing factors

Direct observation identified several factors contributing to inadequate handover practices (Table 2). The absence of a structured handover protocol was universal, observed in all 130 handovers (100%).

Multitasking was observed in 88 handovers (67.7%), and handover materials were lacking in 51 cases (39.2%). Variation in handover space was noted in 65 cases (50.0%), interruptions occurred in 63 (48.5%), insufficient time was observed in 64 (49.2%), and 48 handovers (36.9%) lacked a clear and concise report.

Table 2
Frequency of contributing factors observed during postoperative handover (N = 130)

Contributing factor	Present, n (%)	Absent, n (%)
Absence of structured protocol	130 (100.0)	0 (0.0)
Multitasking	88 (67.7)	42 (32.3)
Handover space variation	65 (50.0)	65 (50.0)
Insufficient time	64 (49.2)	66 (50.8)
Interruptions	63 (48.5)	67 (51.5)
Lack of handover materials	51 (39.2)	79 (60.8)
Lack of clear and concise report	48 (36.9)	82 (63.1)
"Present" indicates the factor was observed during the handover; "Absent" indicates it was not observed.		

Chi-square analysis revealed significant associations between specific barriers and handover outcomes (Table 3). Multitasking showed the strongest association with procedural failures (chi-square = 16.277, $p < 0.001$, odds ratio [OR] = 4.0). Lack of handover materials (chi-square = 6.031, $p = 0.014$, OR = 1.8) and lack of clarity in the report (chi-square = 8.892, $p = 0.003$, OR = 2.4) also reached statistical significance. In contrast, interruptions ($p = 0.792$), insufficient time ($p = 0.861$), and handover space limitations ($p = 1.000$) did not demonstrate statistically significant associations with handover quality.

Table 3
Association between contributing factors and handover quality outcomes (N = 130)

Contributing factor	x^2	p-value	Odds ratio
Multitasking	16.277	< 0.001	4.0
Lack of clear and concise report	8.892	0.003	2.4
Lack of handover materials	6.031	0.014	1.8
Interruptions	0.070	0.792	1.0
Insufficient time	0.031	0.861	1.0
Handover space variation	0.000	1.000	1.0
FIGURE			

Correlation analysis

Pearson correlation analysis was conducted to assess the relationships between SBAR completeness scores and contributing factors. A statistically significant positive correlation was found between SBAR completeness and handover duration ($r = 0.262$, $p = 0.003$). A moderate negative correlation was observed between SBAR completeness and multitasking ($r = -0.405$, $p < 0.001$). No significant correlations were found between SBAR completeness and adequate time ($r = 0.026$, $p = 0.773$) or clarity of report ($r = 0.104$, $p = 0.237$). The correlation between SBAR completeness and the presence of a structured protocol could not be computed due to the absence of variation in this variable (all handovers lacked a structured protocol).

DISCUSSION

This study is the first to evaluate postoperative handover practices at district hospital level in Rwanda, providing baseline data on compliance with the SBAR framework, completeness of information transfer, and factors influencing handover quality. The principal findings are threefold: first, while certain clinical information was consistently communicated, critical elements including ASA classification, airway status, intraoperative findings, pain level, and discharge criteria were frequently omitted; second, the complete absence of a structured handover protocol was universal, and multitasking was both highly prevalent and the factor most strongly associated with procedural failures; and third, process-related factors (protocol absence, multitasking, lack of materials, and report clarity) were more strongly associated with handover deficiencies than environmental factors such as interruptions, time constraints, or space variation. These findings have important implications for patient safety in resource-limited settings, where structured handover systems are often lacking.

The finding that anesthetists initiated the majority of handovers (72.3%) is consistent with their central role in managing intraoperative care and patient stability. Midwives (55.4%) and nurses (44.6%) were the primary recipients, reflecting their responsibility for immediate postoperative monitoring in the PACU. This distribution is comparable to findings from a study at the Centre Hospitalier Universitaire de Butare (CHUB) in Rwanda, where 85.3% of handovers were between anesthesia providers and PACU nurses (12), and to a UK study that demonstrated active involvement of anesthetists and nurses in postoperative handover (18). The absence of anesthesiologist participation in handover initiation reflects staffing structures at district-level hospitals in Rwanda, where anesthetists rather than anesthesiologists predominantly manage anesthesia care. This distinction is important because it highlights a systemic reliance on non-physician anesthesia providers in district hospitals, a model common across low- and middle-income countries (LMICs) where specialist workforce shortages persist. While this model enables surgical services to function, it also underscores the need for structured handover protocols that compensate for potential variability in training and communication practices among different cadres of providers.

Most handovers (73.1%) occurred within the first 10 minutes after the patient left the operating room, and 77.7% lasted less than 5 minutes. While timely initiation may reflect operational efficiency, the brevity of handover duration raises concerns about the completeness of information transfer, particularly for complex surgical cases. A study at Addenbrooke's Hospital, Cambridge, reported a mean handover duration of approximately 1 minute per patient (19), and a study in BMC Anesthesiology reported a mean of 146 seconds (20), suggesting that brief handovers are a widespread phenomenon rather than a setting-specific issue. However, the significant positive correlation between handover duration and SBAR completeness ($r = 0.262$, $p = 0.003$) observed in our study indicates that longer handovers allow for more thorough information transfer. This finding does not advocate for unnecessarily prolonged handovers but rather highlights that the current brevity may come at the cost of critical information omission. The 26.9% of handovers that occurred after 10 minutes may reflect logistical challenges such as the physical distance between operating rooms and PACUs, competing clinical demands, or the absence of a designated handover area, all of which are amenable to organizational improvement.

Although 68.5% of handovers included a complete Situation report, critical elements within this domain were frequently omitted. ASA classification was reported in only 33.8% of handovers, and the patient's current issue was omitted in 71.5% of cases. These omissions are clinically significant: ASA classification aids in risk stratification and care prioritization (21), and the current issue provides essential context for immediate postoperative management. Comparatively, a prospective study at Letterkenny University Hospital, Ireland, found that ASA classification was not transferred in 29% of handovers (22), while a study at Dilla University Referral Hospital in Ethiopia reported ASA classification transfer in only 4.3% of cases (11). Our findings fall between these two benchmarks, suggesting partial but insufficient adherence to structured communication. The variability across settings likely reflects differences in training, institutional culture, and the availability of structured handover tools. Poor handover quality has been associated with negative consequences for patients, nurses, and healthcare organizations (23), and the omission of ASA classification in particular may impair the receiving team's ability to anticipate and prepare for postoperative complications.

The Background component was better communicated than other SBAR domains, with type of anesthesia (92.3%) and surgical procedure (90.0%) reported at high rates. This likely reflects the prominence of these elements in the operative record and their immediate relevance to postoperative management. However, allergy history (46.2%) and intraoperative events (56.2%) were frequently omitted. The underreporting of allergy history is particularly concerning, as allergic reactions in the immediate postoperative period can be life-threatening and require prompt recognition. Reine et al. found that information omissions in handovers ranged from 1 to 13 items (median, 7), with handovers of vitally stable patients associated with more omissions (1), suggesting that perceived patient stability may lead to complacency in information transfer. This phenomenon may partly explain our findings, as many postoperative patients in district hospitals undergo relatively straightforward procedures, potentially reinforcing a perception that comprehensive handover is unnecessary.

The Assessment component revealed the most significant gaps across all SBAR domains. While general status (68.5%) and fluid status (66.9%) were relatively well communicated, airway status (20.0%) and intraoperative findings (19.2%) were rarely reported. These findings are consistent with the Dilla University study, which reported intraoperative fluid management in 80.8% of cases but intraoperative blood loss in only 9.6% (11). The low rate of airway status reporting is particularly concerning, as airway complications including obstruction, laryngospasm, and aspiration are among the most critical risks in the immediate postoperative period. Failure to communicate airway information may delay recognition and management of these potentially life-threatening complications. Pain level was reported in only 41.5% of handovers, representing a systemic gap in addressing patient comfort and postoperative pain management. This is particularly concerning given that Aljahdali et al. found that 37.5% of patients experienced postoperative pain following general anesthesia (24), underscoring the need for systematic pain assessment during handover. The Joint Commission has identified communication failures as the primary contributing factor in anesthesia-related sentinel events (2), and communication failures have been shown to contribute to patient injury in 43% of anaesthesia malpractice claims (25). The pattern of omissions observed in our study, particularly in the Assessment domain, represents exactly the type of communication failure that these analyses have linked to patient harm.

Discharge criteria were communicated in only 13.8% of handovers, representing the most substantial gap across all SBAR components and a critical deficiency in preparing the receiving team for discharge readiness. Without clear discharge criteria, PACU staff must rely on subjective judgment to determine when patients are ready for transfer to the ward, potentially leading to delays, uncertainty, and unsafe premature discharge. The postoperative plan was communicated in 57.7% of cases, and further action was recommended in 48.5%, indicating that even when clinical plans were discussed, specific actionable recommendations were often lacking. The significance of standardized checklists in addressing such gaps has been highlighted by Jaulin et al. in the British Journal of Anaesthesia, who demonstrated that a standardized handover process with a checklist improved both quality and safety of care in the PACU (5). In our setting, the implementation of a structured checklist that explicitly includes discharge criteria could substantially improve this critical gap.

The complete absence of a structured handover protocol, observed in 100% of handovers, was the most prevalent contributing factor and represents a fundamental systems-level deficiency. This finding aligns with a narrative review by Shahid and Thomas, which highlighted that communication failures have been identified as a root cause in more than 70% of serious medical errors (26). In the absence of any structured protocol, handover content and quality depend entirely on individual provider initiative, memory, and experience, leading to the marked variability observed across SBAR components in this study. Multitasking was observed in 67.7% of handovers and showed both the strongest statistical association with procedural failures (chi-square = 16.277, $p < 0.001$, OR = 4.0) and a moderate negative correlation with SBAR completeness ($r = -0.405$, $p < 0.001$). The odds ratio of 4.0 indicates that handovers involving multitasking had four times the odds of procedural failures compared with those without multitasking. Van Rensen et al. similarly highlighted that multitasking during patient handover in the recovery room is common and increases information loss (27). In our setting, multitasking is likely

attributable to inadequate staffing levels, which force healthcare providers to simultaneously manage handover communication and other clinical tasks. Addressing this issue requires both organizational changes, such as ensuring adequate staffing during handover periods, and behavioral interventions, such as designating a protected time and space for handover free from competing demands.

Lack of handover materials (39.2%) showed a statistically significant association with handover quality (chi-square = 6.031, p = 0.014, OR = 1.8), while lack of clarity in the report (36.9%) was also significant (chi-square = 8.892, p = 0.003, OR = 2.4). The association between lack of materials and poor handover quality likely reflects the absence of printed checklists, handover forms, or other structured documentation tools that can serve as cognitive aids during information transfer. In contrast, interruptions (48.5%), insufficient time (49.2%), and handover space variation (50.0%) did not reach statistical significance. Reine et al. reported a similar interruption rate of 46% (1), suggesting that interruptions are a pervasive feature of postoperative handover environments across different settings. The lack of statistical significance for these environmental factors does not diminish their clinical relevance but rather suggests that, in our setting, process-related factors, particularly protocol absence and multitasking, are the primary drivers of handover deficiencies and should be the primary targets for intervention.

The strengths of this study include its observational design, which captured handover practices in real time without relying on self-reported data that may be subject to recall bias and social desirability bias. The use of a validated assessment tool (PoHAT) adapted to the SBAR framework ensured a systematic and comprehensive evaluation of handover quality across multiple domains. The inclusion of two hospitals with different surgical capacities and levels within the Rwandan healthcare system enhances the representativeness of findings at the district hospital level. The sample size of 130 handovers, determined using a validated sampling formula, provides sufficient observations for the descriptive and inferential analyses conducted.

Several limitations should be acknowledged. First, the study was limited to two hospitals in Kigali, and findings may not be generalizable to other settings in Rwanda, particularly rural district hospitals with different staffing patterns and case mixes. Second, observations were conducted during day shifts only, one day per week, potentially missing variations in handover practices during night shifts or weekends and introducing potential selection bias. Third, the observational nature of the study may have introduced the Hawthorne effect, whereby healthcare providers altered their behavior due to the presence of observers; however, the persistent deficiencies observed suggest that any such effect was limited. Fourth, although the PoHAT tool has demonstrated excellent inter-rater reliability in prior studies (r = 0.96) (16), formal inter-rater reliability testing was not conducted in the present study setting. Fifth, the absence of qualitative components limits exploration of the underlying reasons for incomplete handovers, which represents an important area for future research. Finally, the study did not assess clinical outcomes associated with handover deficiencies, and future research should examine the direct relationship between handover quality and postoperative complications in this setting.

CONCLUSIONS

This study demonstrates that postoperative handover practices at two district hospitals in Rwanda are characterized by frequent omission of critical clinical information. While basic patient identifiers and procedural details were generally well communicated, essential elements including ASA classification, airway status, intraoperative findings, pain level, and discharge criteria were omitted in the majority of handovers. The complete absence of a structured handover protocol was universal, and multitasking was identified as the strongest modifiable factor associated with procedural failures, with handovers involving multitasking having four times the odds of procedural failures compared with those without multitasking. These findings indicate that handover quality in this setting is primarily compromised by process-related deficiencies rather than environmental constraints, and that targeted interventions could yield substantial improvements.

Based on these findings, we recommend three priority interventions. First, the implementation of a standardized, SBAR-based handover checklist that explicitly includes all critical elements, particularly those frequently omitted in this study (ASA classification, airway status, pain level, and discharge criteria). Second, targeted training for theatre and PACU staff on structured handover communication, with emphasis on the clinical importance of each SBAR component. Third, organizational changes to reduce multitasking during handover, including ensuring adequate staffing levels and designating a protected time and space for handover free from competing clinical demands. Future research should include multicenter studies across different levels of the Rwandan healthcare system, qualitative approaches to explore the underlying barriers to effective handover communication, and longitudinal studies to evaluate the impact of structured handover interventions on both handover quality and patient outcomes.

Declarations

Ethics approval and consent to participate

Ethical approval was obtained from the Institutional Review Board of the University of Rwanda, College of Medicine and Health Sciences (Ref: CMHS/IRB/032/2025). Ethical clearance was also granted by the administrations of Kibagabaga Level II Teaching Hospital and Kacyiru District Hospital. Written informed consent was obtained from all participating healthcare providers prior to data collection.

Clinical trial number

Not applicable

Consent for publication

Not applicable.

Availability of data and materials

All data generated or analyzed during this study are included in this published article.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

KE: Conceptualization, Methodology, Writing original draft, Project administration.

AWKM: Study design, Investigation, Writing review and editing. **FJP:** Data curation, Investigation, Writing review and editing. **MGSM:** Data curation, Investigation, Writing review and editing. **IS:** Data curation, Investigation, Formal analysis and editing. **TJL:** Ethics oversight, Writing review and editing. **AY:** Supervision, Methodology, Writing review and validation

KNJ: Supervision, editing and validation

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Figures

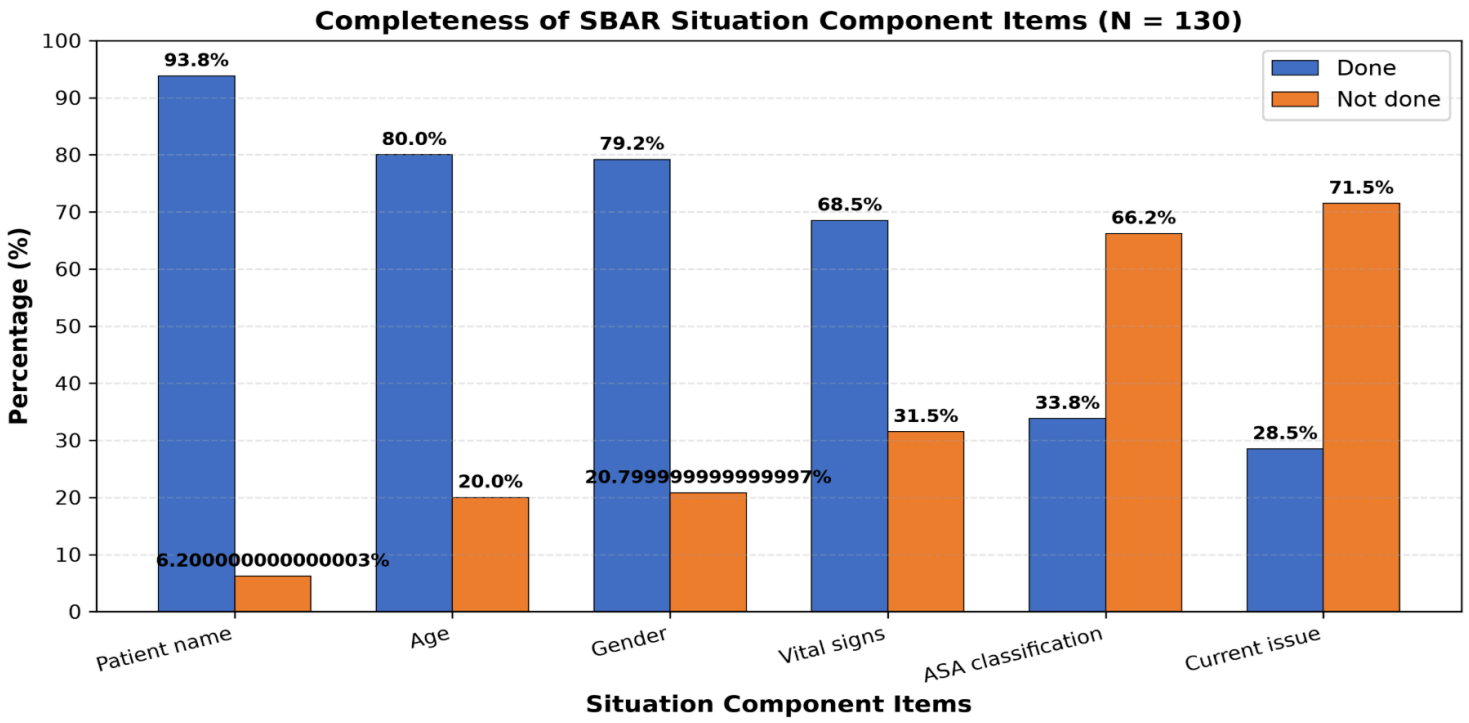


Figure 1

Completeness of SBAR Situation component items (N = 130). Bar chart showing the frequency and percentage of each Situation item communicated during postoperative handover, including patient name (93.8%), age (80.0%), gender (79.2%), vital signs (68.5%), ASA classification (33.8%), and current issue (28.5%).

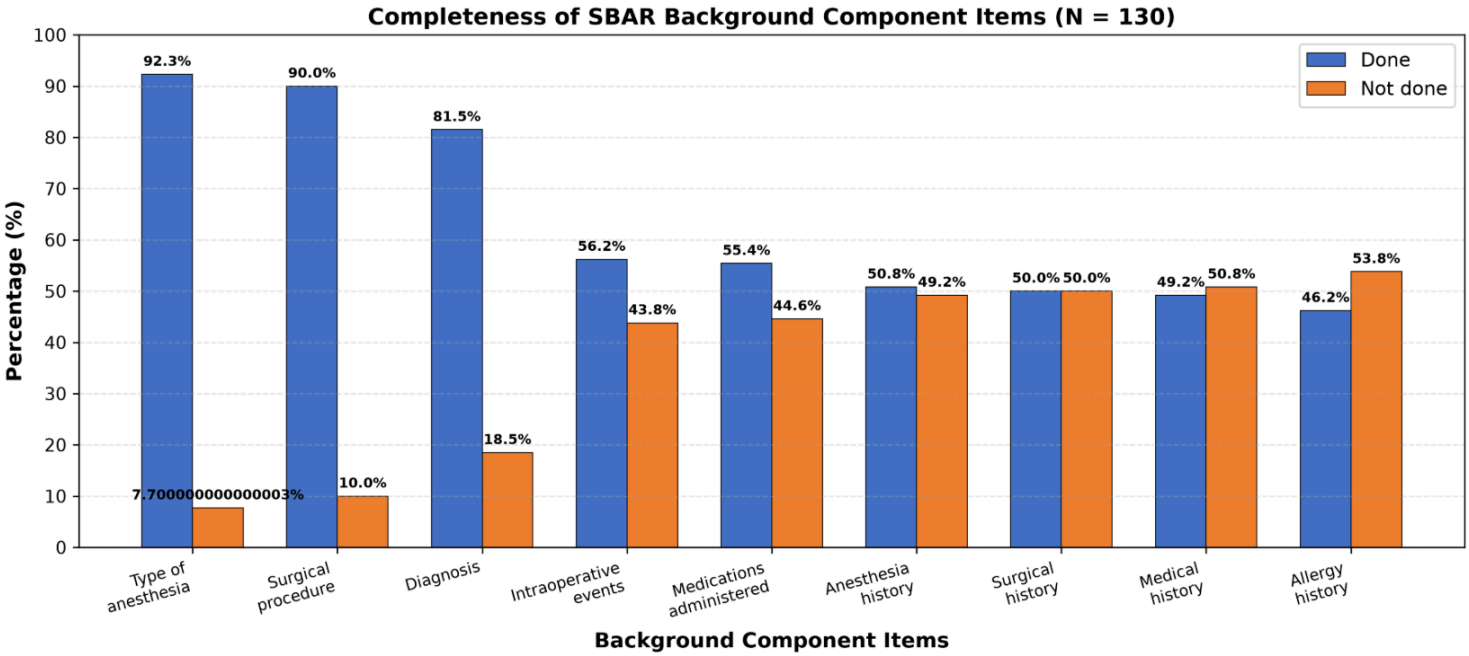


Figure 2

Completeness of SBAR Background component items (N = 130). Bar chart showing the frequency and percentage of each Background item communicated during postoperative handover, including type of anesthesia (92.3%), surgical procedure (90.0%), diagnosis (81.5%), intraoperative events (56.2%), medications administered (55.4%), anesthesia history (50.8%), surgical history (50.0%), medical history (49.2%), and allergy history (46.2%).

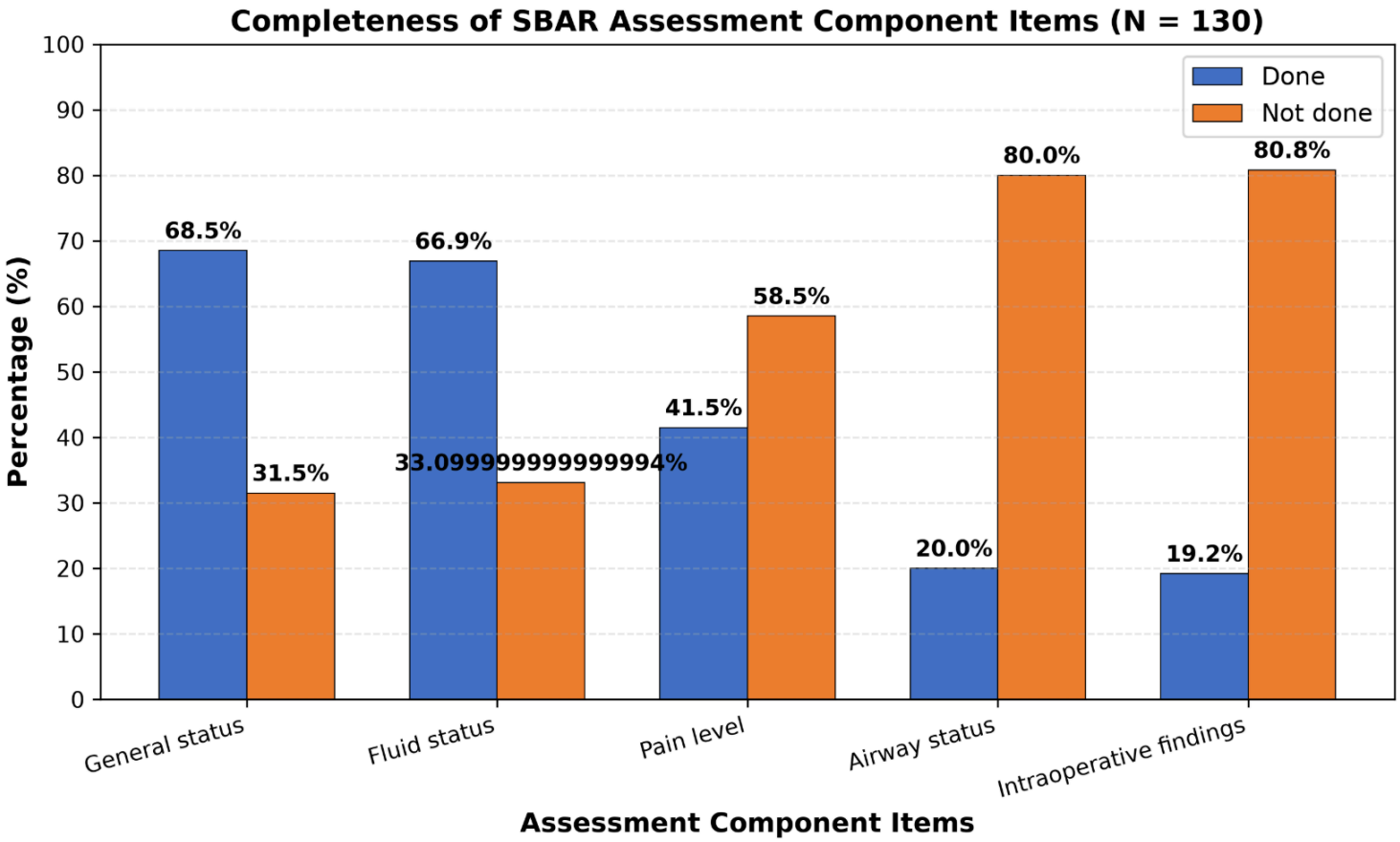


Figure 3

Completeness of SBAR Assessment component items (N = 130). Bar chart showing the frequency and percentage of each Assessment item communicated during postoperative handover, including general status (68.5%), fluid status (66.9%), pain level (41.5%), airway status (20.0%), and intraoperative findings (19.2%).

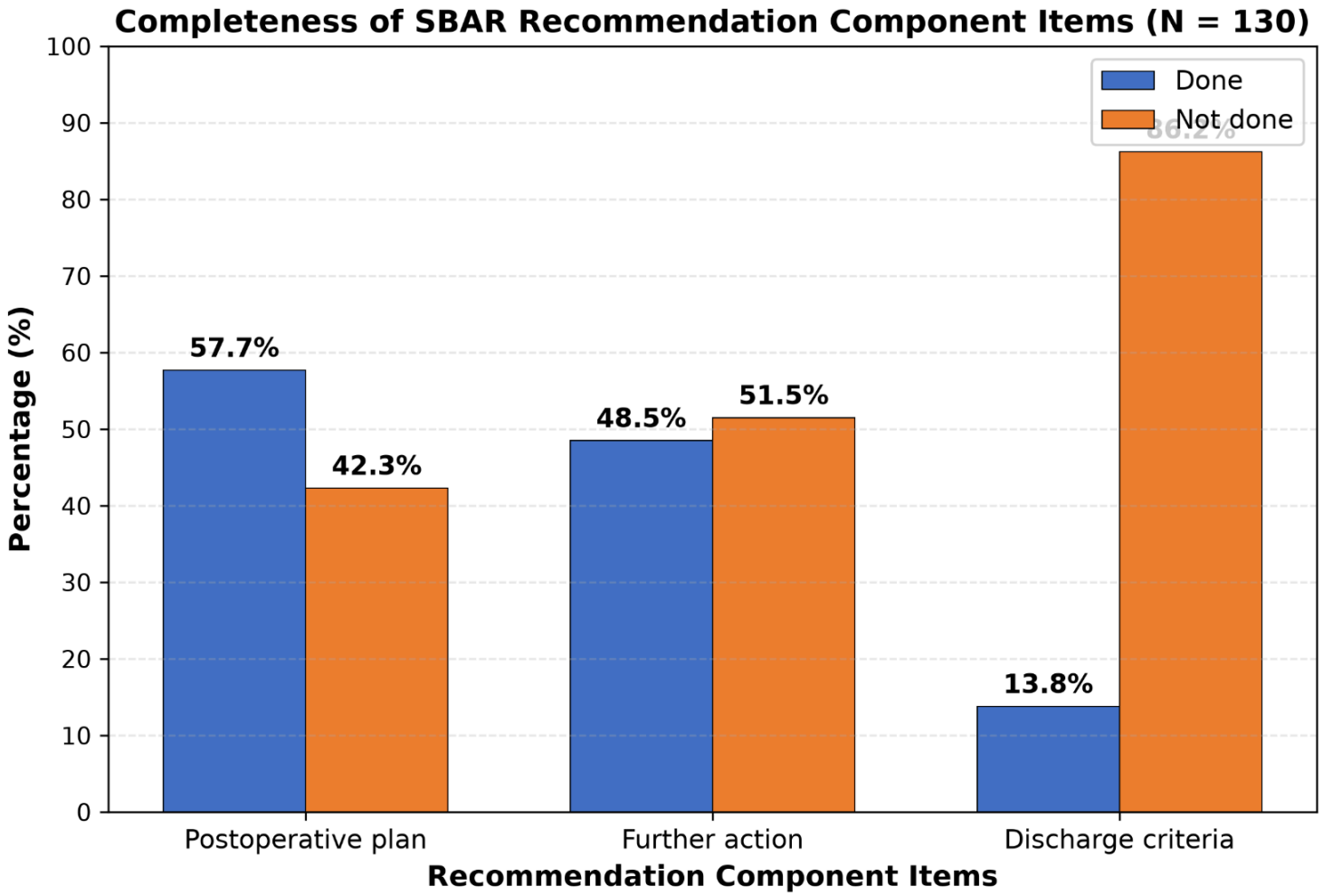


Figure 4

Completeness of SBAR Recommendation component items (N = 130). Bar chart showing the frequency and percentage of each Recommendation item communicated during postoperative handover, including postoperative plan (57.7%), further action (48.5%), and discharge c