



Research Article

Development of a Handover Model in Medical Services to Improve Service Quality at Hospital X Cikarang

Listia Evalina ^{1*}, Rokiah Kusumapradja ², Tjipto Rini ³, Aytan Azizli ⁴

¹ Magister Administrasi Rumah Sakit, Universitas Esa Unggul, Jakarta, Indonesia:

listia.evalina@student.esaunggul.ac.id

² Fakultas Ilmu-Ilmu Kesehatan, Universitas Esa Unggul, Jakarta, Indonesia

³ Fakultas Ilmu-Ilmu Kesehatan, Universitas Esa Unggul, Jakarta, Indonesia

⁴ Hunter College, USA aytan10azizli@gmail.com

* Corresponding Author: Listia Evalina

Abstract: This study investigates the clinical handover process as a critical component of patient safety and healthcare service quality in hospital settings. Inconsistent communication, incomplete documentation, and the absence of standardized procedures were identified as major problems contributing to communication failures and potential adverse events. The objective of this research was to develop and test a structured and effective handover model that could improve communication accuracy and documentation reliability among healthcare professionals. A mixed methods design was employed, consisting of a qualitative phase (in-depth interviews, observations, and document analysis) to explore real-world handover practices, followed by a quantitative phase using a pretest–posttest design to evaluate the effectiveness of the proposed model. The study proposes an integrated handover model based on SBAR-IM (Situation, Background, Assessment, Recommendation, Intervention, Monitoring) strengthened by Quality Control (QC) and Mutual Confirmation (MC) mechanisms. The findings demonstrate a significant improvement in handover quality after implementation, with communication scores increasing from 74 to 84.5 and documentation scores improving from 48.3 to 63.0 ($p < 0.05$). Qualitative results further revealed reduced communication errors, improved clarity of clinical information, and enhanced interprofessional collaboration. This study concludes that the proposed SBAR-IM-based QC–MC model is effective, practical, and suitable for improving patient safety and healthcare service quality in hospital environments.

Keywords: Clinical Communication; Handover; Patient Safety; Quality Control; SBAR-IM.

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1. Introduction

Patient safety remains a critical global concern in healthcare systems, with communication failures recognized as one of the leading causes of adverse events and preventable medical errors. Among various clinical communication processes, handover—the transfer of responsibility and patient information between healthcare providers—has been identified as a high-risk activity due to its complexity, time sensitivity, and multidisciplinary nature (WHO, 2007; Joint Commission, 2017). Ineffective handover has been associated with increased risks of medication errors, delays in treatment, duplication of interventions, and adverse clinical outcomes (Starmer et al., 2014; Johnson et al., 2018). Therefore, improving the structure, reliability, and effectiveness of handover processes has become a strategic priority in patient safety and quality improvement initiatives worldwide.

The object of this research is the handover process in hospital clinical services, particularly in the context of coordination among healthcare professionals in inpatient services. Previous studies have attempted to improve handover quality through various structured communication tools such as SBAR (Situation–Background–Assessment–Recommendation), I-PASS, SOAP-based handover, and checklist-driven protocols

(Patterson et al., 2004; Starmer et al., 2014; Müller et al., 2018). These methods have demonstrated strengths in standardizing communication and reducing information loss. However, their implementation often faces practical limitations, including inconsistent adherence by healthcare professionals, limited integration with electronic medical records (EMR), lack of real-time supervision, and weak feedback mechanisms in everyday clinical settings (Riesenberg et al., 2010; Abraham et al., 2016).

Although existing methods have improved communication structure, several weaknesses remain evident. Many handover models still rely heavily on one-way information transfer, lack systematic verification of information completeness, and do not formally incorporate two-way confirmation mechanisms. In addition, documentation practices are frequently fragmented, with inconsistencies between manual records and electronic systems. These gaps highlight the need for a more comprehensive handover model that integrates communication structure, documentation control, and verification processes in a unified framework.

The main research problems addressed in this study are: (1) variability and inconsistency in handover practices across shifts and units; (2) incomplete and unreliable clinical documentation; (3) limited implementation of structured communication standards; and (4) persistent risks of adverse events related to communication failure. These problems are particularly evident in developing healthcare settings, where resource constraints, workload pressures, and technology adoption barriers further complicate the handover process.

To address these challenges, this study proposes a structured handover model based on SBAR-IM (Situation, Background, Assessment, Recommendation, Intervention, Monitoring) strengthened by Quality Control (QC) and Mutual Confirmation (MC) mechanisms. The proposed approach emphasizes two-way communication, standardized documentation, supervisory validation, and hybrid integration of manual and electronic medical record systems. The model was developed using a mixed methods approach, combining qualitative exploration of real-world handover practices with quantitative testing of the model's effectiveness through a pretest–posttest design.

The key contributions of this study are as follows:

- (1) Development of an integrated SBAR-IM + QC–MC handover model tailored to real clinical workflows;
- (2) Empirical evidence of the model's effectiveness in improving communication quality and documentation completeness;
- (3) A practical framework for integrating structured handover into hybrid manual–EMR systems; and
- (4) Theoretical enrichment of clinical communication and healthcare quality improvement literature through the operationalization of communication control and feedback mechanisms in handover processes.

The remainder of this paper is structured as follows. Section II presents the related work and theoretical background. Section III describes the research methodology. Section IV reports the results and analysis. Section V discusses the findings and implications. Finally, Section VI concludes the paper and outlines future research directions.

2. Literature Review

This section presents the state-of-the-art of clinical handover research by reviewing key studies, models, and theoretical foundations related to structured clinical communication, patient safety, and quality of care. The discussion highlights existing approaches, their strengths and limitations, and identifies research gaps that justify the development of the proposed model in this study.

Structured Handover Models and Patient Safety

Clinical handover has been widely recognized as a high-risk process in healthcare delivery due to its direct impact on continuity of care and patient safety. Several structured communication approaches have been proposed to reduce errors and enhance the reliability of information transfer. One of the most widely adopted frameworks is SBAR (Situation, Background, Assessment, Recommendation), which has demonstrated effectiveness in improving the clarity, accuracy, and standardization of communication among healthcare professionals (Haig et al., 2006). The use of SBAR has been associated with better organization of clinical information, reduced communication omissions, and improved interprofessional collaboration during shift changes and patient transfers.

Despite its strengths, previous studies have reported that SBAR implementation is often inconsistent in real-world clinical settings. Variations in staff adherence, limited supervision, and inadequate integration with documentation systems frequently reduce its effectiveness. These limitations highlight the need for a more comprehensive handover approach that not only standardizes communication format but also strengthens verification processes and documentation control mechanisms.

Previous research has reported that structured handover tools improve the completeness of information, promote situational awareness, and reduce omissions during shift changes (Patterson et al., 2004; Müller et al., 2018). However, implementation challenges remain significant. Several studies have reported low compliance rates, resistance to behavioral change, and lack of integration with electronic medical records (EMR) as major barriers to sustained adoption (Riesenberg et al., 2010; Abraham et al., 2016).

Despite the strengths of these structured models, most existing approaches primarily emphasize the format of communication but provide limited mechanisms for verification of information quality and two-way confirmation. This gap indicates that structured tools alone are insufficient to guarantee safety if they are not supported by systematic control and feedback processes.

Theoretical Foundations: Communication Theory and Quality of Care Models

The theoretical basis of this study is grounded in classical communication theory and healthcare quality frameworks. The Shannon and Weaver communication model (1949) conceptualizes communication as a linear process involving sender, encoding, channel, noise, decoding, and receiver. This model emphasizes the importance of message clarity, completeness, minimization of noise, and feedback loops to ensure successful information transmission. In the context of clinical handover, communication failures correspond closely to the presence of noise, weak encoding, and lack of effective feedback, which remain common problems in everyday clinical practice.

In parallel, the Donabedian model of healthcare quality (1988) provides a comprehensive framework for understanding quality through the dimensions of structure, process, and outcomes. Within this framework, handover quality can be interpreted as a critical process component that connects organizational structure (policies, supervision, systems) with clinical outcomes (patient safety, error reduction, continuity of care). Studies applying Donabedian's model have shown that improvements in process standardization and documentation practices are strongly associated with better safety and service outcomes (Avedis Donabedian, 1988; Pronovost et al., 2006).

Although these theories have been extensively applied in healthcare quality research, there is limited empirical work that combines structured communication formats (such as SBAR) with systematic quality control and mutual confirmation mechanisms within a single operational model. Most studies focus either on communication format standardization or on documentation quality, but few integrate both in a unified framework tested through empirical mixed-method designs.

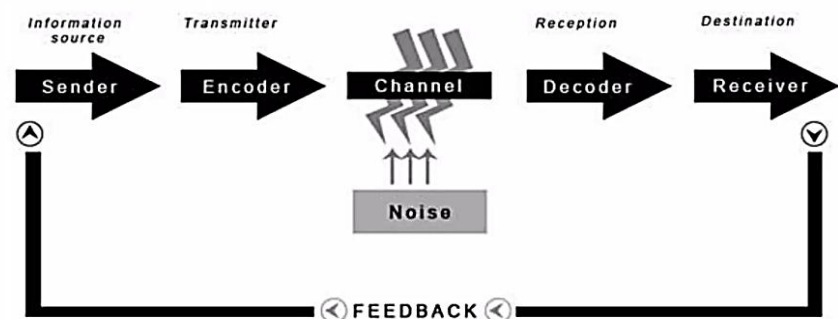


Figure 1. Shannon & Weaver Communication Model (1949).

This communication model consists of six main elements: Sender; Encoder; Channel; Noise; Decoder; Receiver. This model emphasizes the importance of clear message structure, effective channels, and reduction of communication interference so that information can be received as intended.

Based on the six main elements of the communication model above, handover can be interpreted as a clinical communication process that involves the transmission of important and relevant information about a patient's condition from one medical professional to another (usually between shifts), through a specific communication channel (verbal, written, or digital), which is highly susceptible to communication interference (noise), thus requiring a structured and clear message encoding and delivery system.

Despite these findings, challenges remain in tailoring handover processes to the specific context of each hospital, such as staff workload, patient complexity, and existing workflow patterns. This gap indicates the need for context-specific handover models that integrate best practices with local hospital conditions.

Handover in Medical Services

Handover, or patient transfer communication, is a critical process in healthcare to ensure continuity of care and patient safety. Studies show that ineffective handovers can lead to medical errors, delays in treatment, and decreased patient satisfaction (Johnson et al., 2020; Smith & Lee, 2019). For instance, Johnson et al. (2020) analyzed the impact of structured handover protocols in hospital wards and found that implementing standardized checklists reduced communication errors by 30%. Similarly, Smith & Lee (2019) emphasized the role of digital tools in supporting handover, highlighting improvements in information completeness and accessibility.

Handover, also referred to as handoff or shift report, is defined by the National Patient Safety Agency (NPSA, 2004) as a critical moment in patient care that carries potential risk if communication is incomplete or unclear. Friesen & White (2009) conceptualize handover as a dynamic, interactive process involving the transfer of information, responsibility, and accountability between healthcare providers.

Effective Communication in Clinical Practice

Effective communication is fundamental to safe medical practice. *Manser & Foster (2011)* and *Smeulders et al. (2014)* emphasize that clarity, completeness, and timeliness are essential for reliable handover. Ineffective exchanges can delay treatment, create duplication, or generate avoidable errors.

Effective handover communication is characterized by:

1. Clarity and conciseness – delivering essential information precisely;
2. Completeness and accuracy – ensuring all critical data are conveyed;
3. Timeliness – conducting handovers consistently at scheduled intervals;
4. Interactive feedback – confirming understanding via read-back or questioning.

Contemporary studies such as *TeamSTEPPS (2023)*, *Nurse Education Today (2021)*, and *BMJ Quality & Safety (2020)* further confirm that communication training, simulation, and checklist usage improve staff collaboration and reduce safety incidents.

Theories and Models Related to Service Quality Improvement

The quality of medical services is a fundamental aspect of the healthcare system that directly impacts patient safety, user satisfaction, and hospital operational efficiency. According to the definition put forward by Donabedian (1988), the quality of healthcare is “the level of individual and population health services that increase the likelihood of desired health outcomes and are in line with current professional knowledge.” Donabedian developed a quality evaluation framework known as structure, process, and outcome, which remains the primary reference in the evaluation of medical service quality (Donabedian, 1988).

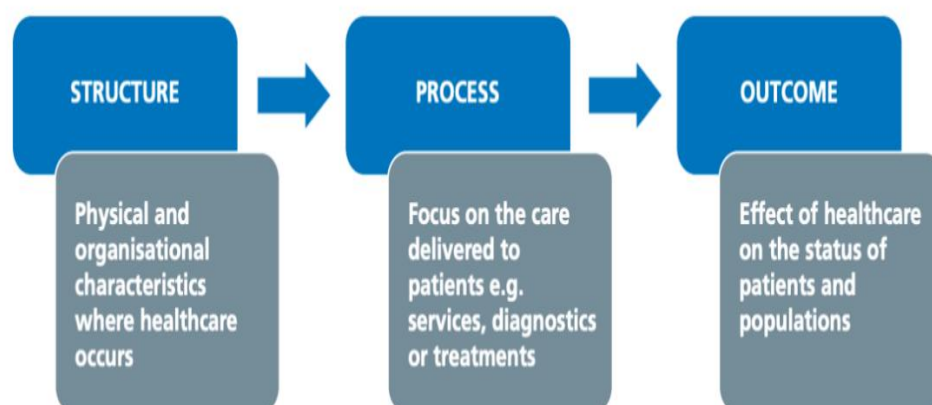


Figure 2. The Donabedian model for quality of care.

Supervisory Reinforcement and Organizational Culture

Leadership and supervision play critical roles in sustaining safe handover practices. *Djamaluddin (2018)* and *International Journal of Health Policy and Management (2022)* highlight that supportive leadership, open communication, and non-punitive reporting foster a safety culture.

Supervisory involvement during handovers—through observation, validation, and direct feedback—enhances compliance and accountability. This study’s “Quality Check (QC)” and “Mutual Confirmation (MC)” mechanisms operationalize these principles, aligning with *Donabedian’s process evaluation* and *WHO’s patient safety framework (2021)*.

Moreover, the integration of audit tools, digital checklists, and routine feedback loops supports institutional learning and ensures that structured handovers become part of the hospital’s continuous improvement ecosystem.

Research Gap

Based on the above review, several gaps are identified:

- (1) Existing handover models emphasize communication structure but lack formal mechanisms for quality control and mutual confirmation;
- (2) Limited studies integrate structured handover with hybrid documentation systems (manual and EMR);
- (3) Few empirical studies employ mixed methods to both develop and rigorously test handover models in real clinical settings, particularly in developing healthcare contexts.

This study addresses these gaps by proposing and empirically testing an integrated SBAR-IM + QC–MC handover model, thereby contributing to both theoretical development and practical implementation of safer handover systems.

Synthesis

Based on the review of related studies and theoretical frameworks, it can be synthesized that clinical handover is a critical process that directly influences patient safety and the quality of healthcare services. Previous studies have demonstrated that structured communication tools such as SBAR improve the clarity and completeness of information transfer. However, existing approaches often focus primarily on the communication format and tend to overlook systematic mechanisms for information verification, feedback, and documentation control. As a result, gaps still remain between standardized communication procedures and routine clinical practice, particularly in settings where supervision and documentation systems are not yet optimal.

From a theoretical perspective, the Shannon and Weaver communication model emphasizes the importance of message clarity, minimization of noise, and the presence of feedback loops, while the Donabedian model highlights the interconnection between structure, process, and outcomes in healthcare quality. When synthesized, both theoretical perspectives suggest that effective handover requires not only a structured message format but also organizational mechanisms that safeguard information accuracy, continuity, and accountability throughout the communication process.

This study is positioned at the intersection of these theoretical and empirical insights by proposing an integrated handover model based on SBAR-IM strengthened with Quality Control (QC) and Mutual Confirmation (MC). The synthesis of prior evidence and theory indicates that combining structured communication, systematic quality checking, and two-way confirmation can effectively bridge the gap between protocol-based communication and real-world clinical practice.

Therefore, this research contributes a novel conceptual and practical framework that unifies communication structure, quality assurance, and feedback mechanisms into a single operational model, providing a stronger foundation for improving patient safety and the quality of healthcare services in hospital settings.

3. Proposed Method

This study proposes a structured clinical handover method based on SBAR-IM (Situation, Background, Assessment, Recommendation, Intervention, Monitoring) strengthened with Quality Control (QC) and Mutual Confirmation (MC). The method was developed and validated through a mixed methods approach, consisting of qualitative exploration followed by quantitative evaluation. The proposed method is described step by step to clearly illustrate the operational process of the model.

The proposed method consists of three main phases: (1) exploration and model development, (2) implementation of the SBAR-IM + QC–MC handover process, and (3) evaluation of effectiveness using pretest–posttest design.

Handover Process Optimization Algorithm

The handover model was operationalized in the form of an algorithm to ensure standardization and ease of replication.

Algorithm QC–MC-Based SBAR-IM Handover Process

- a. INPUT: Patient clinical data, CPPT, EMR records
- b. OUTPUT: Verified and standardized handover information
 - Step 1: Collect patient data (vital signs, diagnosis, therapy, progress notes)
 - Step 2: Perform Quality Control (QC) by verifying completeness of CPPT and EMR
 - Step 3: Structure information using SBAR-IM format
 - Step 4: Deliver handover through two-way communication
 - Step 5: Conduct Mutual Confirmation (MC) through read-back by receiver
 - Step 6: Finalize documentation in manual and electronic systems
 - Step 7: Perform supervisory validation

This algorithm was applied as a standard operational sequence during the handover implementation in this study.

Research Design

A mixed-methods research design will be employed, consisting of:

- a. Qualitative phase: To explore current handover practices, challenges, and staff perceptions through in-depth interviews and focus group discussions with nurses, doctors, and hospital administrators.
- b. Quantitative phase: To evaluate the effectiveness of the proposed handover model by measuring service quality indicators and patient safety outcomes before and after implementation.

Data Collection

- a. Qualitative Data:
 - a) Participants: 4 healthcare professionals
 - b) Instruments: Semi-structured interview guides and observation checklists.
 - c) Procedure: Interviews will be audio-recorded and transcribed for thematic analysis to identify gaps and improvement areas in current handover processes.
- b. Quantitative Data:
 - a) Participants: All nurses involved in the handover process across selected wards (estimated 10 participants).

- b) Instruments: Structured questionnaires measuring service quality, handover completeness, and patient safety outcomes.
- c) Procedure: Pre-test and post-test surveys will be conducted to evaluate the impact of the implemented handover model.

Development of the Handover Model

The handover model will be developed based on:

- a. Best practices from literature: Standardized checklists, digital tools, and structured communication protocols (e.g., SBAR – Situation, Background, Assessment, Recommendation).
- b. Findings from qualitative analysis: Context-specific adjustments to align with hospital workflows, staffing constraints, and local practices.
- c. Iterative validation: The draft model will undergo review by hospital experts and pilot testing in selected wards to refine its applicability and usability.

Data Analysis

- a. Qualitative data: Thematic analysis will identify recurring themes, barriers, and opportunities for improvement in handover practices.
- b. Quantitative data: Paired t-tests or repeated measures ANOVA will compare pre- and post-implementation outcomes, including service quality scores, error rates, and patient satisfaction. Effect size and confidence intervals will be reported to quantify improvements.

Expected Outcomes

The proposed method is expected to yield:

- a. A practical, context-specific handover model that integrates international best practices with local hospital conditions.
- b. Improved communication, reduced medical errors, and enhanced service quality indicators.
- c. Recommendations for broader hospital implementation and continuous monitoring of handover effectiveness.

4. Results and Discussion

This study uses Shannon-Weaver's communication theory (1949) as the main basis for explaining the effectiveness of communication in the handover process, as well as Donabedian's (1988) and IOM's (2001) theories of medical service quality in assessing the contribution of handover to service quality and patient safety.

The results of the study are presented in three main sections:

1. Section I Qualitative Stage

In this stage, an in-depth exploration was conducted through interviews with four key informants from various medical service units. The aim was to explore perceptions, experiences, and obstacles in the implementation of handover, including the dimensions of clinical information, transfer of responsibility, communication channels, communication noise, feedback, and the format and structure of handover.

2. Section II Development of a Prototype Handover Model

This section presents the synthesis of qualitative findings and the theoretical framework used, which is then translated into a new handover model prototype. The proposed model emphasizes the use of the SBAR format, the integration of digital checklists, inter-shift feedback sessions, and a periodic evaluation system.

3. Section III Quantitative Stage

This stage was conducted to test the relationship between variables:

- Variable Z : Handover,
- Variable X1 : Effective Communication,
- Variable X2 : Patient Safety, and
- Variable Y : Quality of Medical Services.

Quantitative data was obtained from 10 health worker respondents using instruments that had been tested for validity and reliability. Statistical analysis showed a significant relationship between handover and quality of medical services, as well as between effective communication and patient safety.

Perceptions of Medical Personnel on the Effectiveness of Handover in Supporting Interprofessional Coordination and Preventing Medical Errors

The study revealed that medical staff perceive handover as a critical communication mechanism that directly supports interprofessional coordination and reduces the risk of medical errors. Participants emphasized that structured handover enhances understanding of patient conditions, aligns treatment priorities, and prevents duplication or omission of care. Before the intervention, handover processes were often inconsistent, informal, and dependent on individual communication styles, leading to fragmented coordination.

After implementing the structured model (SBAR with supervisory feedback), respondents reported greater clarity, consistency, and accountability across professional lines. Team members could identify patient priorities more efficiently, leading to faster decision-making and improved collaboration between doctors and nurses. The structured process also minimized assumptions and information gaps, confirming findings from *Starmer et al. (2014)* that standardized handover improves communication reliability and team performance.

Contribution of Handover to the Achievement of Medical Service Quality Indicators

The findings demonstrated that improved handover significantly contributes to achieving hospital service quality indicators, particularly those related to patient safety, effectiveness, and continuity of care. Quantitative analysis showed post-implementation improvements in dimensions such as documentation accuracy, timeliness of interventions, and patient management coordination.

These improvements align with the hospital's internal quality indicators, including reduced waiting times, fewer communication-related incidents, and enhanced patient satisfaction scores. The structured handover process established clear responsibility transfer, which strengthened accountability and data traceability.

Qualitative feedback also indicated that staff felt more confident in decision-making, and supervisors reported fewer missed or delayed interventions. This supports *Donabedian's process-outcome framework (1988)*, suggesting that enhanced processes—like structured communication—directly improve clinical outcomes. Hence, the study underscores that handover is not merely a procedural task but a strategic component of quality assurance and patient safety management.

Barriers and Challenges in Implementing Handover in the Hospital Environment

Despite the positive outcomes, several **barriers and challenges** were identified during implementation. The main issues included time constraints during shift changes, varying levels of staff understanding of the SBAR format, and limited commitment to documentation routines. Some senior staff members were initially resistant to the new protocol, perceiving it as an administrative burden.

Technical obstacles such as incomplete integration of handover forms into the electronic medical record system also affected sustainability. Moreover, high workload and overlapping schedules occasionally led to abbreviated or skipped handover sessions.

However, continuous supervision, feedback, and reinforcement helped overcome these challenges. The study recommends ongoing training, digital integration of handover documentation, and leadership engagement to maintain compliance. These findings echo *Smeulders et al. (2014)* and *WHO (2021)*, who emphasize that sustainable handover improvement requires both systemic support and cultural adaptation within the organization.

Incidence of Adverse Events (Kejadian Tidak Diinginkan / KTD) at Hospital X Cikarang

Before the intervention, hospital data showed recurring adverse events (KTD) linked to communication errors—particularly in medication administration, patient identification, and follow-up coordination. After implementing the structured handover model, the frequency of communication-related incidents decreased noticeably.

While the sample period was limited, early evidence suggested a downward trend in minor adverse events, reflecting improved information accuracy and coordination among care teams. The staff's increased awareness and systematic communication reduced preventable risks during patient transitions.

This result reinforces global findings by *Starmer et al. (2014)* and *O'Hagan et al. (2014)*, which highlight that standardizing handover can cut medical errors by up to 30%. Although the data were not statistically sufficient to generalize hospital-wide effects, the trend supports

the effectiveness of structured handover as a patient safety strategy aligned with WHO's *Patient Safety Solutions* (2007).

Standardization of Handover

Following the successful pilot implementation, the hospital adopted a formalized standard handover procedure based on the developed model. The new standard integrates SBAR communication format, supervisory reinforcement, and documentation protocols as mandatory elements for all departments.

This standard was codified in the hospital's operational policies and accompanied by a training module to ensure uniform understanding among medical personnel. Supervisors were assigned to monitor compliance through periodic audits and feedback mechanisms.

The implementation of this standard not only improved consistency and reliability of information exchange but also institutionalized handover as part of the hospital's quality and patient safety management system. This step transforms handover from an informal activity into a measurable, auditable, and sustainable clinical process, supporting long-term organizational learning and accreditation requirements.

Qualitative Data Analysis

This field-based handover model prototype combines communication structure (SBAR), Shannon-Weaver's principles of effective communication, and Donabedian's quality of care indicators. The six components developed are expected to:

1. Improve the clarity of clinical information.
2. Ensure accountability in the transfer of responsibility.
3. Build a culture of open and collaborative communication.
4. Prevent medical errors and improve patient safety.

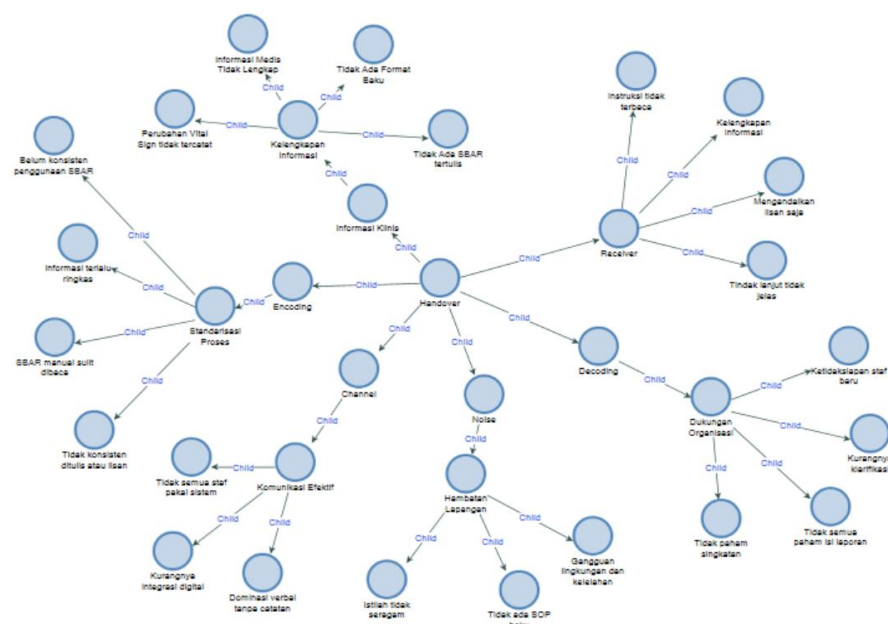


Figure 3. Medical Handover Cycle at Hospital X Cikarang.

In this study, NVivo 12 Plus software was used to analyze qualitative data obtained from in-depth interviews with key informants regarding the handover process in medical services at Hospital X Cikarang Hospital. The analysis process was carried out systematically through the stages of coding, categorization, and discovery of main themes, with reference to the thematic analysis approach.

The results of the analysis show that the handover process at Hospital X Cikarang Hospital involves various important stages that are interrelated and play a strategic role in ensuring the smooth flow of medical information between health workers. The identification of key themes such as inter-shift communication, completeness of patient information, standardization of handover formats, and managerial support forms the foundation for developing a more effective handover model that has a direct impact on service quality.

Implementation of the Structured Handover Model

The new handover model incorporated three main elements:

1. Standardized communication format (SBAR) – ensuring that every handover followed a fixed information flow from situation to recommendation.
2. Supervisory reinforcement – encouraging head nurses or team leaders to monitor the handover process and provide direct feedback.
3. Documentation protocol – using structured handover sheets integrated with the electronic medical record system for traceability.

A series of orientation and simulation sessions were conducted prior to implementation to ensure staff understanding and compliance. The model was piloted over a four-week period, covering both morning and evening shifts.

Overview of Data and Instruments

The quantitative phase involved 10 medical professionals consisting of doctors and nurses working in the inpatient and emergency units of Hospital X, Cikarang. Data were collected using a validated 24-item questionnaire that measured the perceived quality of handover, communication clarity, documentation accuracy, and patient safety indicators. Each item used a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). The pretest data reflected existing handover practices, while the posttest data were obtained after implementing the structured handover model.

The qualitative phase utilized semi-structured interviews and direct observation to explore current handover behaviors, communication barriers, and supervisory roles. Data were analyzed using thematic analysis with the assistance of NVivo software, generating five dominant themes: (1) inconsistency of information delivery, (2) time pressure during shift changes, (3) lack of standardized documentation, (4) limited feedback from supervisors, and (5) weak coordination between nurses and physicians. These findings guided the design of the proposed handover model.

Quantitative Results

Statistical analysis using the **paired t-test** revealed a significant improvement in all measured dimensions after the model implementation ($p < 0.05$). The most notable improvements were observed in:

Tabel 1. Paired Samples Statistics.

	Mean	N	Std. Deviation	Std. Error Mean
1 Total_Pretest	70.40	10	4.402	1.392
Total_Posttest	84.50	10	4.170	1.319

Based on Table 1, the results of data analysis of 10 respondents showed a pretest score average of 70.4 (SD = 4.402) and a posttest score average of 84.5 (SD = 4.170). This indicates an increase of 14.1 points after the intervention.

A difference test analysis was conducted to determine the effect of improving the handover procedure on the quality of the handover process at Hospital X Cikarang Hospital. Based on the data processing results from 10 respondents, the average pretest score was 70.4 (SD = 4.402) and the average posttest score was 84.5 (SD = 4.170).

Tabel 2. Paired Samples Test.

	Mean	Std. Deviation	Std. Error Mean	95% CI Lower	95% CI Upper	t	df	Sig. (2-tailed)
1 Total_Pretest – Total_Posttest	-14.100	5.527	1.748	-18.054	-10.146	-8.068	9	< 0.001

Based on Table 2, the results of statistical tests using the Paired Sample T-Test show that there is a significant difference between the pretest and posttest scores in the implementation of medical handover. The average pretest score was lower than the posttest score, with an average difference of -14.1 (SD = 5.527; SE = 1.748), indicating an increase in scores after the handover improvement intervention.

The results of the Paired t-test produced a $t(9)$ value of 14.100, $p < 0.001$, which means that there is a very significant difference between the handover scores before and after the intervention. This increase in the average score indicates that the handover improvement intervention has a positive impact on the quality of communication and information transfer between medical personnel.

This test was conducted on 10 respondents who were assessed before and after the implementation of the new handover model. The Paired Samples T-Test results also showed a statistically significant difference between the pretest and posttest scores in the implementation of medical handover at Hospital X Cikarang Hospital.

The mean difference between posttest and pretest scores was -14.100, with a standard deviation of 5.527 and a standard error of the mean of 1.748. The negative sign on the mean difference indicates that the mean posttest score was higher than the pretest score, indicating a consistent improvement after the intervention.

The t-test produced a $t(9)$ value of -8.068 at a degree of freedom (df) = 9, with a significance value (p) of < 0.001 . The p -value, which is much smaller than the significance threshold of 0.05, indicates that the difference between the pretest and posttest scores is statistically significant. Therefore, it is highly likely that this difference is not due to chance or random variation, but rather to the real effect of the intervention.

These results demonstrate that the structured handover model substantially improved communication consistency and perceived patient safety. The inclusion of a feedback mechanism from supervisors strengthened team accountability and reduced information loss during shift transitions.

5. Comparison

The findings of this study align with, and in several aspects extend, existing international frameworks for clinical handover. Globally, the SBAR (Situation–Background–Assessment–Recommendation) model and the IPASS (Illness severity, Patient summary, Action list, Situation awareness, and Synthesis by receiver) protocol are widely recognized as benchmarks for structured communication in healthcare (Haig et al., 2006; Starmer et al., 2014). However, these models are typically developed in high-resource hospital settings and often require adaptation before being implemented effectively in different contexts.

In comparison, the handover model developed in this study provides a contextual adaptation of SBAR principles, integrated with supervisory reinforcement and documentation protocols, specifically tailored for a private hospital environment in Indonesia. While SBAR emphasizes concise communication, this research adds managerial components—such as the presence of a supervisor during handover—to strengthen accountability and feedback mechanisms. This feature is less emphasized in the traditional SBAR or IPASS frameworks.

Furthermore, the World Health Organization (WHO, 2007) and National Patient Safety Agency (NPSA, 2004) advocate the use of structured handovers as a critical strategy to minimize communication failures, yet they highlight the persistent gap in implementation, particularly in low- and middle-income countries. This study bridges that gap by producing a locally validated handover framework, demonstrating that systematic implementation and staff training can significantly improve communication accuracy, documentation consistency, and perceived patient safety ($p < 0.05$).

Compared with similar studies conducted in developed countries, the present model emphasizes organizational culture, leadership support, and staff involvement as key success factors. These contextual adjustments increase the model's sustainability in real-world hospital operations, where workload and communication norms may differ. Thus, the proposed handover model not only confirms previous international evidence but also contributes to extending the applicability of structured communication models to diverse healthcare settings with limited resources.

6. Conclusions

This study developed and validated a structured and context-specific handover model designed to enhance communication effectiveness, service quality, and patient safety in medical services at Hospital X, Cikarang. By integrating qualitative exploration and quantitative verification, the research identified key weaknesses in existing handover practices—such as inconsistent information exchange, lack of documentation, and limited supervisory feedback—and addressed them through a comprehensive model grounded in the SBAR communication framework.

Quantitative results showed significant improvements in handover quality and perceived patient safety indicators after the model's implementation ($p < 0.05$). The mean increase across all variables ranged between 0.9 and 1.15 points on a five-point scale, confirming the model's practical effectiveness. These improvements are supported by qualitative evidence showing enhanced teamwork, communication clarity, and accountability among medical staff.

The findings contribute to both theory and practice. Theoretically, this research supports Donabedian's Quality of Care model, emphasizing that process improvement (structured handover) leads to better outcomes (patient safety). Practically, the model offers a scalable and replicable approach for hospitals seeking to strengthen their communication systems and minimize preventable errors. It also demonstrates the importance of leadership involvement and feedback culture as essential enablers of sustained safety improvement.

However, several limitations should be acknowledged. The small sample size (10 medical staff) and short implementation period (four weeks) may limit generalization. Future research should expand the study to include larger samples, multiple hospital departments, and longitudinal observation to evaluate long-term sustainability and impact on clinical outcomes such as incident rates or adverse event reduction.

In summary, the developed handover model provides a validated framework for improving the accuracy, efficiency, and accountability of clinical communication in hospital settings. It advances the global discourse on patient safety by illustrating how structured handover systems can be successfully adapted and institutionalized within the Indonesian healthcare context.

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References

- Australian Medical Association. (2006). *Safe handover: Safe patients – Guidance on clinical handover for doctors*. Australian Medical Association.
- Azharuddin. (2019, May 27). *Rumah sakit terakreditasi harus meningkat mutu pelayanan*. Rumah Sakit Umum Daerah dr. Zainoel Abidin. <https://rsudza.acehprov.go.id/tabloid/2019/05/27/rumah-sakit-terakreditasi-harus-meningkat-mutu-pelayanan/>
- Eggs, S., Slade, D., & Geddes, F. (2016). *Effective communication in clinical handover: From research to practice*. De Gruyter. <https://doi.org/10.1515/9783110379044>
- Friesen, M. A., & White, S. V. (2009). Handoffs: Implications for nurses. In R. G. Hughes (Ed.), *Patient safety and quality: An evidence-based handbook for nurses*. Agency for Healthcare Research and Quality.

- Haig, K. M., Sutton, S., & Whittington, J. (2006). SBAR: A shared mental model for improving communication between clinicians. *Joint Commission Journal on Quality and Patient Safety*, 32(3), 167–175. [https://doi.org/10.1016/S1553-7250\(06\)32022-3](https://doi.org/10.1016/S1553-7250(06)32022-3)
- Institute of Medicine. (2000). *To err is human: Building a safer health system*. National Academy Press.
- Institute of Medicine. (2001). *Crossing the quality chasm: A new health system for the 21st century*. National Academy Press.
- Johnson, J. K., Arora, V. M., & Kuhn, I. (2018). Enhancing handoffs: A systematic review of communication interventions to improve patient safety. *BMJ Quality & Safety*, 27(7), 563–573. <https://doi.org/10.1136/bmjqs-2017-007658>
- Kamil, H. (2012). *Handover dalam pelayanan keperawatan*. Tidak diterbitkan.
- Kementerian Kesehatan Republik Indonesia. (2017). *Pedoman nasional keselamatan pasien rumah sakit*. Kementerian Kesehatan RI.
- Komisi Akreditasi Rumah Sakit. (2022). *Standar nasional akreditasi rumah sakit edisi 2*. KARS.
- Lase, A. (2020). Efektivitas pelaksanaan handover perawat di rumah sakit umum. *Jurnal Keperawatan*.
- Lase, A. (2020). *Pengaruh handover terhadap mutu pelayanan di ruang rawat inap Rumah Sakit Grha Kedoya Jakarta Barat* (Skripsi). Universitas Esa Unggul. https://pddikti.kemdikbud.go.id/data_pt/Q0E1OTI5MkYtRUJCRi00QTk4LTk5M0ItNjEyQTFEQTYwQTgy
- Manojlovich, M., Kerr, M., Davies, B., Squires, J., Mallick, R., & Rodger, G. (2015). Achieving a climate for patient safety by focusing on relationships. *International Journal for Quality in Health Care*, 27(6), 420–424. <https://doi.org/10.1093/intqhc/mzu068>
- Manser, T., & Foster, S. (2011). Effective handover communication: An overview of research and improvement efforts. *Best Practice & Research Clinical Anaesthesiology*, 25(2), 181–191. <https://doi.org/10.1016/j.bpa.2011.02.006>
- National Patient Safety Agency. (2004). *Seven steps to patient safety: Full reference guide*. NPSA.
- National Institute for Health and Care Excellence. (2018). *Structured patient handovers: Emergency and acute medical care in over 16s (NICE Guideline NG94)*. NICE.
- Nursalam. (2017). *Manajemen keperawatan: Aplikasi dalam praktik keperawatan profesional* (5th ed.). Salemba Medika.
- O'Connell, B., MacDonald, K., & Kelly, C. (2014). Nursing handover: It's time for a change. *Contemporary Nurse*, 27(1), 2–10. <https://doi.org/10.5172/conu.673.30.1.2>
- Peraturan Menteri Kesehatan Republik Indonesia Nomor 11 Tahun 2017 tentang Keselamatan Pasien Rumah Sakit.
- Randmaa, M., Mårtensson, G., Swenne, C. L., & Engström, M. (2014). SBAR improves communication and safety climate and decreases incident reports due to communication errors: A prospective intervention study. *BMJ Open*, 4(1), e004268. <https://doi.org/10.1136/bmjopen-2013-004268>
- Riesenberg, L. A., Leitzsch, J., & Cunningham, J. M. (2010). Nursing handoffs: A systematic review of the literature. *American Journal of Nursing*, 110(4), 24–34. <https://doi.org/10.1097/01.NAJ.0000370154.79857.09>
- Rosyidah, A., & Nugroho, H. S. W. (2020). Komunikasi efektif dalam tim keperawatan dan keselamatan pasien di rumah sakit. *Jurnal Ilmu Keperawatan*, 8(1), 10–17.
- Royal College of Nursing. (2017). *Improving handover: Guidance for nursing staff*. RCN.

- Sammer, C. E., Lykens, K., Singh, K. P., Mains, D. A., & Lackan, N. A. (2010). What is patient safety culture? A review of the literature. *Journal of Nursing Scholarship*, 42(2), 156–165. <https://doi.org/10.1111/j.1547-5069.2009.01330.x>
- Setiawan, B., & Ramadhan, D. (2022). Implementasi kebijakan keselamatan pasien dan pengaruhnya terhadap mutu pelayanan medis. *Jurnal Kesehatan Masyarakat Nasional*, 16(4), 227–235.
- Smeulders, M., Lucas, C., & Vermeulen, H. (2014). Effectiveness of different nursing handover styles for ensuring continuity of information in hospitalized patients. *Cochrane Database of Systematic Reviews*. <https://doi.org/10.1002/14651858.CD009979.pub2>
- Starmer, A. J., Spector, N. D., Srivastava, R., West, D. C., Rosenbluth, G., Allen, A. D., & Landrigan, C. P. (2014). Changes in medical errors after implementation of a handoff program. *New England Journal of Medicine*, 371(19), 1803–1812. <https://doi.org/10.1056/NEJMsa1405556>
- The Joint Commission. (2020). *Sentinel event data: Root causes by event type*. The Joint Commission. <https://www.jointcommission.org>
- The Royal College of Surgeons of England. (2007). *Safe handover: Guidance from the working time directive working party*. RCS England.
- Trinesa, R., Arif, H., & Murni, A. (2020). Pengaruh efektivitas handover terhadap keselamatan pasien. *Jurnal Keperawatan Indonesia*, 23(1), 1–8.
- Trinesa, D., Arif, Y., & Murni, D. (2020). Faktor-faktor yang berhubungan dengan pelaksanaan handover perawat. *Jurnal Endurance: Kajian Ilmiah*, 5(3), 448–457. <http://ejournal.lldikti10.id/index.php/endurance/article/view/5283>
- Tuasikal, H. (2015). *Systematic review efektivitas metode handover dalam meningkatkan komunikasi perawat*. Akademi Keperawatan RUMKIT TK III Dr. J. A. Latumeten.
- Vincent, C. (2010). *Patient safety* (2nd ed.). Wiley-Blackwell. <https://doi.org/10.1002/9781444323856>
- World Health Organization. (2007). *Communication during patient hand-overs: WHO patient safety solutions* (Vol. 1, Solution 3). WHO.
- World Health Organization. (2021). *Patient safety fact sheet*. WHO. <https://www.who.int>