

Improve continuity of care through the use of a checklist for Nurse-To-Nurse Handover with SBAR method in Intensive Care. A single-center observational study

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ABSTRACT

Introduction: the World Health Organization promotes the SBAR (Situation Background Assessment Recommendation) method as a standard for handover communication between healthcare professionals. However, in Intensive Care Units (ICUs), there is no universally shared checklist to guide nursing handovers. This study aims to implement an SBAR-based checklist and evaluate its adherence within the sample, as well as measure the effectiveness of a dedicated training program.

Materials and Methods: this is a monocentric observational study with a four-phase design, involving a sample of 28 ICU nurses.

Results: the checklist showed an adherence rate of 68% (n=407). The training program demonstrated a significant increase in the nurses' knowledge (pre-training mean: 6.2; post-training mean: 8.5; p=0.02).

Discussion: the adoption of the checklist, supported by a tailored training course, facilitated a more standardized handover process. It guided nurses in conveying critical patient information in the ICU, improving the completeness of the information shared and reducing the risk of errors.

Conclusion: the implemented checklist proves to be a promising tool for ensuring continuity of care and patient safety in the ICU, underscoring the importance of training for its effective implementation

Key words: nurse handover; patient handoff; SBAR method; intensive care unit; observational study.

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Introduction

The transmission of information among healthcare professionals is a fundamental aspect of the care process. It is indispensable for patient safety, as communication failures account for approximately two-thirds of sentinel events in healthcare.¹ The Joint Commission International has identified communication breakdowns as one of the primary causes of adverse events in healthcare settings.²

The World Health Organization (WHO) has emphasized that the transfer of patient-related information between healthcare providers or across healthcare facilities ensures continuity and safety of care.³

Handover refers to the transfer of professional responsibility and patient care for an individual or group of patients to another person or professional team, either temporarily or permanently.⁴ It is a dedicated moment for conveying updated patient information, during which healthcare professionals communicate relevant events at each shift change and plan the subsequent care process.⁵

Accurate information exchange and care continuity are crucial in all healthcare settings, particularly in Intensive Care Units (ICUs), where patients are fragile, unstable, and require high-complexity care.

Nurses often do not use a standardized methodology for transmitting clinical and care-related information, relying instead on “personalized” methods that vary depending on the context.⁶ These unstructured, narrative-style handovers often lead to excessive information exchange, hindering the listener’s ability to retain key details while also increasing the risk of distraction and loss of critical clinical data essential for effective care planning.⁷

Utilizing a standardized format is beneficial for structured handovers, as it ensures the necessary information is transmitted without data loss.⁸ This, in turn, enhances care planning and improves both the quality and safety of patient care.

The importance of standardized and structured tools for handover communication has been internationally recognized in WHO’s patient safety action plan. Among the methodologies described in the literature, the SBAR (Situation, Background, Assessment, Recommendation) method has been recommended since 2007.⁹

SBAR was designed as a situational debriefing tool, focusing on problems rather than individuals, to rapidly convey essential information needed by the receiving physician or healthcare provider.¹⁰ It is applicable in any healthcare setting and can be used for both oral and written communication, as well as for patient admissions, transfers, or discharges. SBAR is suitable for nurse-to-physician, physician-to-physician, and nurse-to-nurse handovers.¹¹

The absence of a checklist based on scientifically validated methods to guide nurse-to-nurse handovers in ICUs increases the risk of incomplete, unclear, or redundant information transfer.^{12,13}

Objectives

The primary aim of this study is to implement a nursing handover checklist based on the SBAR method, tailored to the specific care needs of our ICU, and to evaluate adherence to its completion across nursing shifts. The secondary aims are to examine nurses’ perceptions regarding the clarity, accuracy, and safety of the information transmitted and received through the checklist and to analyze the effectiveness of a targeted training program in facilitating the application of the SBAR method within our clinical setting (Table 1).

Materials and Methods

This was a monocentric observational study conducted in four phases between January and December 2023.

Phase I: between January and February 2023, the habits and personal perceptions regarding handovers within the entire ICU nursing team were investigated through a custom-designed questionnaire, titled the “Native Handover Survey.” This questionnaire was specifically developed for this research project by the authors and subsequently reviewed by an Academic Expert, Professor Anna Maria Grugnetti (AMG).

Phase II: between April and May 2023, a convenience sample of 28 nurses working in the Neuro-Trauma ICU section was selected. All participants attended three training sessions. The first session involved the entire sample and consisted of a lecture aimed at training the group on the use of the SBAR method for patient handover between healthcare professionals. At the end of the lecture, a 45-minute brainstorming session was conducted with participants to identify key information deemed essential for handovers and care planning within our setting. The second session utilized role-playing exercises to demonstrate the application of the SBAR method in various clinical case scenarios. Additional scenarios were provided to allow participants to practice. The final session reviewed and contextualized the critical and non-negotiable information required for ICU nursing handovers.

Phase III: an electronic SBAR-based checklist, named “ICU-SBAR HANDOVER,” was developed, incorporating the information gathered during Phase II. The checklist was initially tested by the participating nursing staff to identify potential shortcomings or limitations before the official observation period. The checklist was subsequently used for 30 days in June 2023, completed in digital format by the same 28 nurses included in this study. Participants rotated shifts during the observation period to ensure continuous use. At the end of this period, adherence was evaluated by counting the number of fully completed checklist items in the ICU-SBAR HANDOVER across nursing shifts. Following this, the same nursing sample was administered a satisfaction questionnaire using a 5-point Likert scale (1 = “not satisfied at all” to 5 = “very satisfied”) to assess the perceived usefulness of the implemented handover tool. This questionnaire was designed by the authors and, as in previous phases, was reviewed by an Academic Expert (AMG) before administration.

Phase IV: between May and July 2023, participants’ learning outcomes from the training sessions (Phase II) were assessed using the “Multiple Choice Knowledge Test” (MCKT),¹⁴ a 10-item ques-

Table 1. The SBAR method.

S	SITUATION
	Identification of the patient, brief framing of the situation (reason for admission, event dynamics, hospitalization day).
B	BACKGROUND
	Quick overview of the patient's medical history, the diseases he or she suffers from, the therapy he/she is taking and allergies.
A	ASSESSMENT
	Systematic prioritization approach, focusing on Airway-Breathing-Circulation-Disability-Exposure/Environmental control.
R	RECOMMENDATION
	Everything that is secondary, but relevant (tips for further treatment, any notes to underline).

tionnaire on the SBAR method. The test included a first section assessing “understanding of SBAR’s purpose” (items 1-4) and a second section evaluating “knowledge and application of specific SBAR components” (items 5-10). The results of correct responses were compared between pre- and post-training assessments to measure the effectiveness of the training program.

Statistical analysis

Descriptive statistics were performed using absolute frequency indices, percentage frequency, and arithmetic mean with standard deviation. Inferential statistics included the chi-square (X^2) test and the paired t-test for different variance means, with a statistical significance level set at 0.05. The analysis was conducted using Microsoft Excel 2010 and the JASP Structural Program (JASP), version 0.16.4 (Intel).

Ethical considerations

The study was approved at the local level by the relevant authorities, and all participants agreed and provided written informed consent. Since the study did not involve patients, the convening of an Ethics Committee was not deemed necessary in accordance with local regulations. The study was conducted without interfering with the professionals’ work, ensuring absolute privacy, maintaining the anonymity of the information, and without affecting patient treatment and care times.

Results

The study was conducted in the Anesthesia and Intensive Care Unit 1 (S.C.) of the IRCCS Policlinico San Matteo Foundation in Pavia. The nursing staff consists of 85 nurses, divided into operational teams working 12-hour shifts, 24/7. For the training program, the creation, and the implementation of the checklist, a convenience sample of 28 rotating nurses was selected from the Neuro-Trauma ICU section, which has 10 beds (Table 2). All participants took part in each phase of this research project. There were no dropouts or new enrollments in the sample during the study.

The Native Handover Survey questionnaire was administered to the entire nursing staff ($n=85$), with 63 responses (74%). The recorded information from the questionnaire is reported in Table 3.

The ICU-SBAR HANDOVER checklist, developed during Phase III of the study, was completed in electronic format, including detailed items essential for proper care planning for each patient admitted to our ICU. During the 30-day observation period, the sample ($n=28$) completed 407 checklists, corresponding to 68% of the 600 potentially completed checklists. This total was calculated based on the number of beds in the Neuro-Trauma ICU section ($n=10$), the number of handovers per 24-hour period ($n=2$), and the number of observation days ($n=30$).

The overall completion adherence to the checklist was 68%, reflecting a good level of integration into clinical practice. Additionally, the distribution of completed checklists between shifts was balanced, with 199 checklists completed during the day (49%) and 208 during the night (51%). The inferential analysis conducted with the chi-square test (X^2) did not reveal statistically significant differences between shifts ($p=0.07$), suggesting consistent use of the tool regardless of the time of day.

To assess the satisfaction of the sample ($n=28$) regarding the use of the ICU-SBAR HANDOVER checklist, a custom-designed satisfaction questionnaire was administered. Of the total questionnaires distributed, 27 were completed (96%), as shown in Table 4.

The analysis evaluating the effectiveness of the training pro-

gram revealed a clear improvement in the knowledge levels of the study participants. The MCKT score for the SBAR method showed a significant increase in correct responses, with a pre-training mean of 6.2 ± 1.1 compared to a post-training mean of 8.5 ± 0.8 . The inferential analysis conducted using the paired t-test confirmed the statistical significance of this improvement ($p=0.02$), highlighting the effectiveness of the training in enhancing nurses’ knowledge.

Examining the individual sections of the MCKT score, the “understanding of SBAR’s purpose” (items 1-4) showed a pre-training mean of 7.2 ± 0.9 , increasing to 8.5 ± 0.7 post-training, with a non-statistically significant difference ($p=0.23$). This result suggests that participants already had a good general understanding of the SBAR method before training.

Conversely, the section related to knowledge and application of specific SBAR components (items 5-10) showed a pre-training mean of 5.5 ± 1.2 , increasing to 8.5 ± 0.9 post-training, with a statistically significant improvement ($p=0.05$). This result indicates a substantial enhancement in the specific knowledge required for the practical implementation of the SBAR method.

Discussion

The results presented, in accordance with the primary aim of this study, indicate a high adherence rate (68%) in completing the ICU-SBAR HANDOVER checklist, with particular attention to the Situation, Background, and Assessment sections. Specifically, there was a higher completion rate for items related to airway, breathing, hemodynamics, and neurological status. This finding clearly reflects the educational background of intensive care nurses,¹⁵ which is traditionally based on the systematic ABCDE algorithm (Airway, Breathing, Circulation, Disability, Exposure). This universally recognized method structures the clinical management of emergencies, placing vital conditions at the core of care planning.¹⁶

The use of an SBAR-based checklist to guide nursing handovers serves as a means to transmit comprehensive information in a standardized and systematic manner,^{17,18} as confirmed by the studies of Wang *et al.*¹² and Bonds.¹⁹ A well-compiled checklist allows nurses to gain a clearer and more complete understanding of the patient’s clinical condition, guiding the handover process while reducing the risk of omissions or misunderstandings in care. This, in turn, promotes organized and safe patient care,^{20,21} limits the occurrence of adverse events,²² and enhances continuity of care.²³ The standardization of handover procedures using scientifically validated methods not only reduces variability associated

Table 2. Description of participants.

Gender	% (n.)
Female	57 (16)
Education level	% (n.)
University diploma	4 (1)
Bachelor’s Degree in Nursing	61 (17)
First-level Professional Master’s Degree	36 (10)
Experience (year)	% (n.)
0-5	68 (19)
6-10	18 (5)
11->20	15 (4)

with individual methods but also facilitates the early identification of clinical deterioration, ensuring timely and effective interventions,¹⁶ which are generally crucial in high-complexity settings such as the ICU.

Regarding the secondary aims, the data obtained demonstrate a significant improvement in nurses' knowledge of the SBAR method, as evidenced by the pre- and post-training MCKT scores (6.2 and 8.5; $p=0.02$). The notable increase in correct responses, particularly in the second section of the test (items 5-10), highlights the crucial role of targeted training conducted by expert personnel in bridging theoretical and practical gaps among healthcare professionals. This also suggests that training can positively influence the ability to apply the SBAR method in daily clinical practice, as also emphasized in the studies by Dalky *et al.*²⁴ and Etemadifar *et al.*²⁵

Overall, the implementation of the ICU-SBAR HANDOVER checklist has proven to be a valuable support for nurses, facilitat-

ing the transfer and deep understanding of essential information and promoting the integration of high-quality care. The results of this study confirm the importance of integrating standardized tools into clinical practice following specific training and open new avenues for research, as highlighted in the studies by Muller *et al.*²² Future research should explore strategies to increase adherence to specific sections of the ICU-SBAR HANDOVER checklist and evaluate its long-term impact on near-miss identification, adverse event prevention, and overall improvements in patient safety and clinical outcomes.

Limitations of the study

This study has certain limitations that should be considered. Firstly, the sample size was relatively small, which may have reduced the statistical power of some analyzed variables and limited the generalizability of the findings to other healthcare settings

Table 3. Native handover survey.

Question	Item	% (n.)
How important do you consider verbal handover for continuity of care and patient safety?	Very important	76 (47)
	Important	24 (15)
	Not important / little important	0 (0)
How much time is dedicated to verbal handover?	2 minutes	3 (2)
	5-10 minutes	42 (26)
	11-15 minutes	26 (16)
	>15 minutes	29 (18)
Are you satisfied with the handover you provide to your colleagues?	Always	18 (11)
	Often	61 (38)
	Sometimes	21 (13)
	Never	0 (0)
Do you ever feel that you have omitted any important information?	Always	2 (1)
	Often	19 (12)
	Sometimes	63 (40)
	Never	16 (10)
Are you satisfied with the handover you receive from your colleagues?	Always	5 (3)
	Often	54 (34)
	Sometimes	37 (23)
	Never	3 (2)
Do you believe that interruptions during handovers can have an impact on continuity of care and patient safety?	Always	13 (8)
	Often	33 (21)
	Sometimes	46 (29)
	Never	8 (5)

Table 4. Satisfaction questionnaire.

	1 - Not satisfied at all % (n)	2 - Slightly satisfied % (n)	3 - Neutral % (n)	4 - Satisfied % (n)	5 - Very satisfied % (n)	Missing % (n)
Clarity of received handover	22 (6)	4 (1)	33 (9)	37 (10)	4 (1)	0 (0)
Clarity of delivered handover	8 (2)	0 (0)	48 (13)	33 (9)	8 (2)	4 (1)
Accuracy of received handover	22 (6)	0 (0)	37 (10)	37 (10)	4 (1)	0 (0)
Accuracy of delivered handover	12 (3)	0 (0)	37 (10)	41 (11)	8 (2)	4 (1)
Completeness of received handover	8 (2)	0 (0)	33 (9)	44 (12)	11 (3)	4 (1)
Completeness of delivered handover	4 (1)	4 (1)	29 (8)	48 (13)	15 (4)	8 (2)
Perceived safety of received handover	11 (3)	0 (0)	37 (10)	33 (9)	15 (4)	4 (1)
Perceived safety of delivered handover	4 (n=1)	0 (0)	33 (9)	48 (13)	15 (4)	0 (0)
Overall satisfaction	11 (3)	0 (0)	37 (10)	29 (8)	15 (4)	8 (2)

beyond intensive care. Secondly, the observation period was relatively short, potentially restricting the ability to explore certain checklist items and monitor long-term changes or issues that arise during the use of the ICU-SBAR HANDOVER checklist. Lastly, the absence of an analysis comparing adverse events before and after checklist implementation prevents direct evaluation of its contribution to improving patient safety and preventing sentinel events or near-miss incidents.

Implications for clinical practice

The results of this study provide a basis for adapting the ICU-SBAR HANDOVER checklist to other intensive care settings, facilitating the standardization of nursing handovers and the dissemination of best practices. The adoption of this tool ensures structured and comprehensive transmission of critical information, reducing the risk of omissions and promoting continuity of care, regardless of individual experience or communication style.

Conclusions

The implementation of the ICU-SBAR HANDOVER checklist, supported by a specific training program, has proven to be a promising strategy for standardizing and optimizing the nursing handover process in our Intensive Care Unit. This tool could contribute to improving the quality of delivered care, enhancing patient safety, and reducing the risk of omissions or errors associated with incomplete or unclear information during nursing handovers.

The structured approach provided by the checklist has enabled nurses to strengthen their awareness of patient clinical conditions and ensure greater continuity of care between shifts. Furthermore, it is important to highlight how the adoption of standardized practices can overcome limitations related to individual experience, ensuring uniformity and clarity in the transmission of clinical information. However, the absence of a direct comparison between adverse events recorded before and after the implementation of the tool represents a significant limitation of this study. Future research should further investigate the effectiveness of the checklist in preventing adverse events and near-miss incidents, as well as explore its applicability in other clinical settings. Expanding the scope of research in this direction would help to further consolidate the usefulness of this tool.

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Online supplementary materials

Table 1. ICU-SBAR Handover.

Contributions: LC, Methodology: development or design of methodology; creation of templates; writing - revision and editing: preparation, creation and presentation of work for publication by the original research team, in particular critical examination, commentary or revision - including pre- or post-proposal stages. SGS, Data curation: Management activities to comment on (*i.e.* produce metadata), clean the data and maintain the research data (including software code where it is needed for the interpretation of the data), both for initial use and for subsequent re-use; Writing - original project: Preparation, creation and presentation of the published work, in particular the writing of the initial draft (including substantive translation); SL, formal analysis: Application of statistical, mathematical, computational or other formal techniques to analyse or synthesise the data of the study; RA, conceptualisation: the ideas, *i.e.* the formulation or development of the overall aims and objectives of the research, formal planning of group meetings; BP, AB, investigation: conducting a research and investigation process, specifically carrying out experiments or collecting data and evidence; GM, visualisation: preparation, creation and presentation of published work, particularly with regard to the imaging or presentation of data; AMG, GG, project administration: management and coordination responsibilities for the planning and execution of the research activity.

Ethical approval and consent for participation: the study was approved locally by the competent bodies of our hospital (Fondazione IRCCS Policlinico S. Matteo di Pavia), all participants agreed and gave their informed consent. As the study did not concern patients, the submission of the study to the Ethics Committee was not necessary, in accordance with local regulations.

Conflict of interest: the authors declare no conflict of interest.

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Availability of data and materials: the data and materials used in this study are available and can be shared on request to the corresponding author.

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