Figure Jurnal Info Kesehatan
Vol. 23, No. 1, March 2025, pp. 61-70
P-ISSN 0216-504X, E-ISSN 2620-536X
DOI: *10.31965/infokes.Vol23.Iss1.1900*
Journal homepage: *https://jurnal.poltekkeskupang.ac.id/index.php/infokes*

RESEARCH Open Access

Construction of Validity and Reliability of The SBAR-Based Assessment Scale among Nurses

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Received: 5 February 2025 Revised: 7 March 2025 Accepted: 25 March 2025

Abstract

Situation, Background, Assessment, Recommendation (SBAR) is a communication tool used to convey information clearly and in a structured manner, especially in the context of health services. The implementation of this assesment scale consideration has not been carried out optimally for nurses in the hospital. This study aims to analyze the validity and reliability of the SBAR-based weighing evaluation instrument from primary nurses and associate nurses. Multivariate validity and reliability test using the Exploratory Factors Analysis (EFA) test. The results aim to validate the instrument content. The numbers in the table show the loading factor values for each statement item which have been sorted from the largest value to the smallest value for each component. Statement items are valid and have an important correlation in the handover implementation instrument if they have a factor loading value of <0.40. Of the 25 statement items, 8 items were invalid, namely item numbers 2,3,4,6,10,12,17,19 while the other 17 items were declared valid and formed 4 components (Component 1; Situation indicator, Component 2; Backgound indicator, Component 3; Assessment indicator, Component 4; Assesment) which were used as indicators for compiling the SBAR-based handover implementation instrument. CFA test results were the relative chi-square value (CMIN/df) shows a fairly good fit with a ratio <5, the comparative fit index (CFI) value indicates marginal fit because it is in the range 0.80<CFI <0.90, The root mean square error (RMSEA) value indicates a reasonable agreement with a value of <0.08, the goodness-of-fit (GoF) value indicates a good fit because it is >0.80. It can be interpreted that based on the results of the CFA analysis it has fulfilled the construct feasibility test so that in general it can be said that the handover evaluation instrument by primary nurses and associate nurses is fit to be used in measuring handover implementation.

Keywords: Validity, Reliability, SBAR-based Assessment Scale, Nurses.

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1. INTRODUCTION

The handover process in healthcare settings is a critical component of patient care, as it involves the transfer of critical information between healthcare providers to ensure continuity and safety in care (Desmedt et al., 2021; Manias et al., 2016). In Indonesia, particularly in hospitals such as Lakipadada Hospital in Tana Toraja Regency, handover process standards are often identified as inconsistent, leading to potential gaps in communication that can impact patient outcomes. One method designed to improve the clarity and effectiveness of this communication is the SBAR (Situation, Background, Assessment, Recommendation) model (Citra et al., 2024). This structured framework is used to organize and convey information concisely, ensuring that critical data is shared in a manner that minimizes miscommunication. The gaps in the effective implementation of the SBAR approach may indeed be related to concerns over its validity and reliability as an evaluation instrument (Dalky et al., 2020; Martínez-Fernández et al., 2022). The effectiveness of SBAR in improving patient safety and communication during nursing handovers still requires more rigorous evaluation to ensure it is both valid and reliable across different healthcare environments (Jeong & Kim, 2020). However, despite the recognized importance of the SBAR approach, there are still gaps in its effective implementation in some healthcare facilities, which requires further investigation into its validity and reliability as an evaluation instrument in nursing handovers (Alizadeh-risani et al., 2024).

In the context of Indonesian healthcare, particularly in government hospitals, it is critical to evaluate how well communication tools such as SBAR are integrated into daily clinical practice (Husna et al., 2024; Simamora & Fathi, 2019). Validity of an instrument refers to its ability to measure what it is intended to measure, while reliability relates to the consistency of results over time (Müller et al., 2018). The SBAR-based handover assessment scale, if properly designed and implemented, can serve as a valuable tool to assess how effectively both primary and associate nurses can communicate and transfer patient information during handover (Shahid & Thomas, 2018).

Primary nurses and associate nurses at Lakipadada Hospital play a critical role in the handover process, as they are directly involved in ensuring that patient information is accurately passed on during shift changes or transfers between care teams. Therefore, the accuracy and clarity of their communication can significantly impact patient safety and the effectiveness of the care process (Fuchshuber & Greif, 2022). Inconsistent implementation and inadequate training in the use of SBAR can result in communication breakdowns that undermine its effectiveness. Variations in the use of SBAR can lead to incomplete handoffs, potentially impacting patient safety and quality of care. Without proper evaluation and standardization, there is a significant risk that the tool may not be applied consistently, leading to disparities in the quality of care provided (Abbaszade et al., 2021). However, the implementation of the SBAR-based assessment instrument has not been optimally assessed in terms of its construct validity and reliability in this context (Dietl et al., 2023). Without proper evaluation, there is a risk that the instrument may fail to measure communication effectiveness accurately or may not be applied consistently, leading to potential disparities in the quality of care.

Given the importance of effective communication in preventing medical errors and ensuring the delivery of high-quality care, the lack of an optimized and validated SBAR assessment tool at Lakipadada Hospital is a significant concern (Albeshri et al., 2024). Furthermore, the diverse backgrounds and professional experiences of primary nurses and associate nurses mean that there may be variations in how the SBAR model is applied, further complicating the situation (Ashcraft & Owen, 2017). Thus, it is important to understand whether the current SBAR-based assessment scale accurately reflects the reality of handover practice in hospitals, and whether it can be used reliably to improve communication standards (Lo et al., 2021; Shinta & Bunga, 2024). Exploring the construct validity and reliability of this

scale will help in determining whether it is an appropriate tool to improve handover procedures and, thereby, improve patient care (Bakr et al., 2023).

Instruments are needed to evaluate the implementation of handover. This instrument can assess the implementation of SBAR-based weighing (Rehm et al., 2021). Whether the implementation of weighing has followed the standardized SOP or not. The results of the evaluation using validated instrument standards will provide optimal results. Improvements to SBAR-based handovers can be carried out in accordance with KARS accreditation standards (Miming et al., 2023). Validity and reliability tests carried out can contribute to improving SBAR-based handovers as one of the keys to unlocking quality nursing services. Therefore, this study aims to fill this gap by comprehensively analysing the test of validity and reliability of the SBAR-based handover assessment instrument used at Lakipadada Hospital.

2. RESEARCH METHOD

This research design uses analytical observational. The research was conducted using a Cross-Sectional design approach, namely an approach that observes and measures research variables at one point in time to validity and reliability testing. The population in this study were all nurses on duty in the inpatient ward at Lakipadada Hospital with a total of 124 people. There were 18 primary nurses and 106 associate nurses. The sample in this study were some of the executive nurses who served in the inpatient wards. After carrying out calculations with the help of sample size determination in health study software, a sample size of 18 for primary nurses and 83 for associate nurses was obtained. The sampling technique used is probability sampling, namely cluster random sampling.

The research instrument used was an observation sheet regarding the implementation of SBAR-based consideration, using a Likert scale. The instrument used was then subjected to a construct validity and reliability test using the Exploratory Factors Analysis (EFA) test of the SBAR-based handover implementation instrument. Exploratory Factor Analysis (EFA) is a statistical technique used to identify underlying relationships among variables without predefined hypotheses (Sürücü et al., 2024). It helps reduce a large set of variables into smaller, interpretable factors by examining how variables group together. The process involves factor extraction, rotation for easier interpretation, and evaluating factor loadings to determine the strength of each variable's relationship with the factors. EFA is useful for exploring data and uncovering latent constructs, and it is often followed by Confirmatory Factor Analysis (CFA) to validate the identified factor structure (Sureshchandar, 2023).

The Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA) were used in this study, both commonly indices to assess the goodness-of-fit of a model, particularly in structural equation modeling (SEM) and confirmatory factor analysis (CFA). The CFI is a measure that compares the fit of the specified model to a baseline or null model. It ranges from 0 to 1, with values closer to 1 indicating a better fit. Generally, a CFI value of 0.90 or higher is considered indicative of a good model fit, while values below 0.90 suggest a poor fit. The RMSEA assesses how well the model approximates the population covariance matrix, accounting for model complexity. It ranges from 0 to 1, with lower values indicating a better fit. An RMSEA value of 0.06 or below is generally considered to indicate a good fit, while values between 0.06 and 0.08 are acceptable, and values above 0.10 suggest a poor fit. This study was using IBM SPSS Amos apps to anlysis the instrument. Research Ethics is carried out by submitting a typing test at the research ethics committee, Karya Husada Semarang University with number 001/KEP/UNKAHA/SLE/IX/2022.

3. RESULTS AND DISCUSSION

Table 1. Exploratory Factors Analysis (EFA) results of the SBAR-based handover implementation instrument.

Item	Activity	Component			
		1	2	3	4
1	The nurse explains the patient's identity, by mentioning at least 2 identities (Ex: name and date of birth) when giving a report about the patient's condition	0.567			
5	The nurse mentions objective data supporting the patient's current condition.	0.675			
11	The nurse explains what actions have been taken on the patient.	0.783			
14	The nurse explains in detail the use of the drugs used by the patient, for example: Type and method of administration, etc.	0.484			
15	The nurse mentions allergies and previous medical history.	0.560			
20	The nurse submits suggestions/solutions for further action to overcome the problems that occur	0.536			
25	The nurse who does the handover checks the patient's nursing/medical record again	0.634			
7	The nurse mentions the nursing interventions that have been implemented and those that have not been resolved.		0.707		
8	The nurse approaches the patient and clarifies the patient's current state.		0.461		
9	The nurse reports previous history that supports the current problem (medication, action and last examination) briefly and clearly.		0.876		
13	The nurse explains in detail the installation of the equipment used by the patient, for example: IVs, urinary catheters, etc.		0.427		
18	The nurse conveys the patient's current condition: improving or worsening.		0.426		
16	The nurse explains the patient's current problems and complaints.			0.725	
22	The nurse writes and conveys orders or messages from the DPJP.			0.576	
23	The nurse conveys whether there are actions that will be changed or modified at this time.			0.415	
21	The nurse explains the next treatment plan to the patient.				0.681
24	The nurse conveys a collaborative action plan.				0.876

** Component 1 is named the Situation indicator, Component 2 is named the Backgound indicator, Component 3 is named the Assessment indicator, Component 4 is named Assesment.*

Table 1 is the result of the EFA test which aims to validate the instrument content. The numbers in the table show the loading factor values for each statement item which have been sorted from the largest value to the smallest value for each component. Statement items are said to be valid and have an important correlation in the handover implementation instrument if they have a factor loading value of <0.40. Of the 25 statement items, 8 items were invalid, namely item numbers 2,3,4,6,10,12,17,19 while the other 17 items were declared valid and formed 4 components which were used as indicators for compiling the SBAR-based handover implementation instrument.

Component 1 is named the Situation indicator) which is composed of 7 nurse actions including 1) Explaining the patient's identity; 2) State objective data supporting the patient's current condition; 3) Explain what actions have been taken on the patient; 4) Explain in detail the use of drugs; 5) State allergies and previous medical history; 6) Submit suggestions/solutions for further action to overcome the problems that occur; 7) Carry out handover and re-examine the patient's nursing/medical record.

Component 2 is named the Backgound indicator which is composed of 5 nurse actions including 1) Mentioning nursing interventions that have been implemented and those that have not been resolved; 2) Approaching the patient and clarifying the patient's current condition; 3) Reporting previous history that supports current problems (medication, action and last examination) briefly and clearly; 4) Explain in detail the installation of the equipment used by the patient; 5) Convey the patient's current condition: improving or worsening.

Component 3 is named the Assessment indicator which consists of 3 nurse actions including 1) explaining current patient problems and complaints; 2) Writing and conveying orders or messages from the DPJP; 3) Express whether there are actions that will be changed or modified at this time. Component 4 is named Assesment consists of 2 actions by the nurse covering 1) Explaining the next treatment plan to the patient; 2) Submit a collaborative action plan.

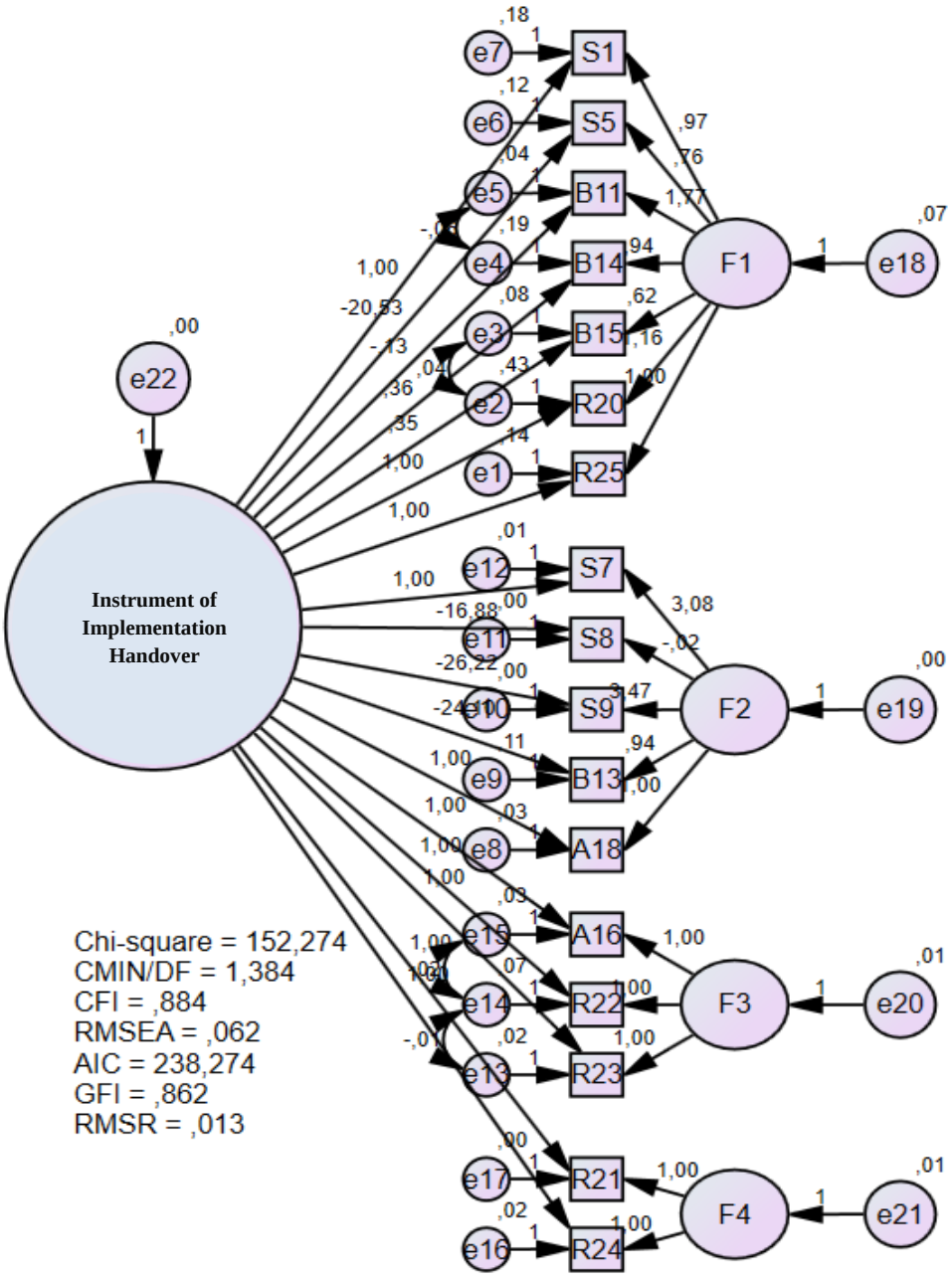

Figure 1. Confirmatory factor model of the handover implementation instrument with correlated errors, showing standardized estimates.

Figure 1 shows that the valid items and the components formed are then included in the Confirmatory Factor Analysis (CFA). CFA aims to test the construct validity of the components that have been formed, referring to the extent to which an instrument can measure what it wants to measure based on its components. Construct validity was assessed based on the goodness of fit criteria of the model formed. Various criteria were examined to assess model fit and simplicity (Figure 1). The results are as follows: 1) The relative chi-square value (CMIN/df) shows a fairly good fit with a ratio <5; 2) the comparative fit index (CFI) value indicates marginal fit because it is in the range 0.80<CFI <0.90; 3) The root mean square error (RMSEA) value indicates a reasonable agreement with a value of <0.08; 4) The goodness-of-fit (GFI) value indicates a good fit because it is >0.80. Based on the results of the CFA analysis, it has fulfilled the construct feasibility test so that in general it can be said that the model or instrument is fit for use in measuring the implementation of SBAR-based handovers.

However, the current instrument differs from the previous one in several significant ways. First, it offers a higher level of granularity, breaking down specific actions in greater detail. For example, item 9 focuses specifically on the nurse's ability to report the patient's medical history relevant to the current condition, which provides a more targeted evaluation than the more general approach of the earlier version. The new instrument also expands its focus to include collaborative actions, with items like 24 and 21, which emphasize conveying a collaborative action plan and explaining the next treatment plan to the patient. These elements may not have been as strongly emphasized in the earlier instrument. Furthermore, the current version places more weight on evaluating the nurse's explanation of the patient's current condition, including whether the condition is improving or worsening, an area that may have been underrepresented in the previous instrument. Lastly, the new instrument includes explicit items like item 25, which focuses on checking the patient's nursing or medical record during the handover—this kind of cross-checking might not have been as clearly articulated in the older version. The advantages of the current instrument are numerous. It provides a more specific and targeted evaluation by breaking down the communication process into distinct components, allowing for more detailed feedback and pinpointing areas for improvement. The instrument also takes a more holistic approach, evaluating not only the nurse's communication with the patient (as seen in items 18, 21, and 16) but also with the healthcare team, ensuring a well-rounded assessment of the handover process.

The current instrument is not without its disadvantages. One potential drawback is its complexity—due to the numerous specific criteria and numerical scoring system, the evaluation process may become time-consuming and challenging to apply consistently across different healthcare settings. The heavy reliance on quantitative scores may also result in an overemphasis on technical accuracy, potentially overlooking the more qualitative aspects of communication, such as empathy, clarity, and the nurse-patient relationship.

The results of the Exploratory Factor Analysis (EFA) in figure 1 indicate that out of the 25 statement items tested, only 17 items were deemed valid, while 8 items were invalid due to having a factor loading value below 0.40. Based on these results, the SBAR-based handover implementation instrument consists of four components, each encompassing a series of relevant nurse actions. These components are Situation, Background, Assessment, and Recommendation, which represent key aspects of an effective handover process. The content validity of this instrument is reinforced by the selection of items with factor loadings greater than 0.40, indicating significant relationships between the items and the components being measured. Following the formation of valid components through EFA, the next step was to conduct Confirmatory Factor Analysis (CFA) to assess the construct validity of the developed instrument. The CFA results indicate that the model shows a good fit, although some indices suggest marginal fit. The relative chi-square value (CMIN/df) below 5 indicates a good fit, while the Comparative Fit Index (CFI) value falling within the range of 0.80 to 0.90 suggests

marginal fit. Nevertheless, the Root Mean Square Error of Approximation (RMSEA) value below 0.08 and the Goodness-of-Fit Index (GFI) above 0.80 suggest that the model overall is acceptable as a valid representation of the constructs being measured.

By meeting the relevant goodness-of-fit criteria, the CFA analysis demonstrates that the developed instrument possesses valid and reliable constructs, making it an effective tool for measuring SBAR-based handover implementation. This indicates that the instrument accurately reflects the key dimensions of handover, which involve clear, structured, and effective communication between healthcare professionals, particularly nurses. Therefore, this instrument is expected to serve as a valuable evaluation tool in enhancing communication quality during handover processes in hospital settings, ultimately contributing to improved patient safety and healthcare service efficiency.

The significance of structured communication tools like SBAR (Situation, Background, Assessment, Recommendation) in nursing handovers has been widely documented. For instance, the implementation of the SBAR tool significantly reduced communication errors, thereby enhancing the quality of patient handovers (Yun et al., 2023). Similarly, effective nursing handovers are pivotal for patient safety, underscoring the need for structured approaches to mitigate risks associated with fragmented communication (Bressan et al., 2020). The findings from these studies align with the current research, which indicates that the validated components of the SBAR-based instrument can serve as reliable indicators for effective handover practices.

Moreover, the importance of tailoring handover practices to the specific context and needs of the healthcare setting cannot be overstated. The structured communication models like SBAR improve understanding between nurses and physicians, facilitating better prioritization and decision-making (Wang et al., 2018). This adaptability is crucial, who argued that handover instruments should be designed to meet the unique requirements of different healthcare environments (Odone et al., 2022). The validation of the SBAR-based handover evaluation scale, therefore, not only enhances its reliability but also ensures its applicability across various nursing contexts.

Furthermore, the implications of the EFA results extend to the training and education of nursing staff. Effective handover practices are influenced by the communication behaviors of nursing staff, which can be enhanced through structured training programs (Kitson et al., 2014). The validated components of the SBAR-based instrument can serve as a foundation for developing educational curricula aimed at improving handover competencies among nurses (Bonds, 2018; Toumi et al., 2024). This aligns with the findings that established that assessment instruments with strong construct validity can effectively evaluate handoff performance in clinical settings (Michael et al., 2021).

This study has several limitations, including the complexity of the instruments used, which rely heavily on quantitative scores, potentially overlooking qualitative aspects like empathy and nurse-patient rapport. While the Confirmatory Factor Analysis (CFA) indicated a good overall fit, some indices, such as the Comparative Fit Index (CFI), showed marginal fit, suggesting room for improvement. The study's sample size and representativeness were limited to nurses from Lakipadada Hospital, which may affect the generalizability of the findings to other settings. Additionally, inconsistent implementation of the SBAR tool could lead to variations in care quality. The focus on quantitative measures also meant that qualitative factors influencing communication effectiveness were not fully explored.

4. CONCLUSION

Based on the results of the EFA test, there are 17 valid items and form 4 components (Component 1: Situation indicator, Component 2: Backgound indicator, Component 3: Assessment indicator, Component 4: Assesment) that can be used as indicators in compiling an SBAR-based handover implementation instrument. The results of the CFA analysis show that the model formed meets the construct feasibility test with a good model fit value. Overall, this

instrument can be used to measure the implementation of SBAR-based handover with proven validity and reliability.

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