

# Situation-Background-Assessment-Recommendation Technique Improves Nurse–Physician Communication and Patient Satisfaction in Cataract Surgeries

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## Abstract

**Background:** Implementation of the Situation–Background–Assessment–Recommendation (SBAR) communication technique has been shown to increase nurse–physician communication and collaboration. However, data regarding its implementation in ophthalmology settings are limited.

**Objective:** The purpose of this study was to evaluate the impact of implementing SBAR on nurse–physician communication and on the safety and satisfaction of patients undergoing cataract surgery.

**Materials and Methods:** This cross-sectional study was conducted in the Ophthalmology Department of Zhongshan Hospital, Xiamen University, Xiamen, China, from April 2016 to December 2018. SBAR was implemented through a 1-h course that was repeated every 2 months for 2 years. All nurses and physicians completed the Physician–Nurse Communication Satisfaction Questionnaire before SBAR implementation and 1- and 2-year post-implementation. In addition, all patients who underwent cataract surgery during the defined pre-implementation and 1- and 2-year post-implementation periods were invited to complete a patient satisfaction questionnaire.

**Results:** In total, 10 nurses and 6 physicians completed all three pre- and post-implementation surveys. In addition, 1215 patients undergoing cataract surgery participated: 358 in the pre-implementation phase, 425 in the 1-year post-implementation, and 432 in the 2-year post-implementation. Physician–nurse communication significantly improved in both 1- and 2-year post-implementation periods compared with the pre-implementation phase ( $P < 0.01$ ). In addition, there was a significant increase in patient satisfaction scores ( $P < 0.01$ ) and a decrease in medical complaints and malpractices ( $P < 0.01$ ) between the pre- and post-implementation phases.

**Conclusion:** SBAR is a useful tool for enhancing nurse–physician communication and for improving the safety and satisfaction of patients undergoing cataract surgery.

**Keywords:** Cataract surgery, hospital communication systems, patient handoff, patient satisfaction, situation-background-assessment-recommendation

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**Submitted:** 12-Oct-2021 **Revised:** 10-Feb-2022 **Accepted:** 23-Mar-2022 **Published:** 28-Apr-2022

Access this article online	
Quick Response Code:	Website: www.sjmms.net
	DOI: 10.4103/sjmms.sjmms_602_21

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**How to cite this article:** Chen Y, Chen HY, Jong GP. Situation-Background-Assessment-Recommendation technique improves nurse–physician communication and patient satisfaction in cataract surgeries. Saudi J Med Med Sci 2022;10:146-50.

## INTRODUCTION

The exchange of patient care information between nurses and physicians occurs daily. The handover process is a crucial step in daily clinical practice.<sup>[1]</sup> It is vital that nurses have access to standardized communication tools to ensure effective transfer of patient information to physicians.<sup>[2]</sup> Poor communication, or miscommunication, between nurses and physicians has been identified as a problem that can compromise patient care and may even result in complications or deaths.<sup>[3,4]</sup>

The Situation–Background–Assessment–Recommendation (SBAR) model has been shown to improve nurse–physician communication by providing a communication framework regarding patient condition.<sup>[2,5]</sup> Given that communication of incorrect information may compromise the treatment outcomes, training nurses regarding this increases their awareness and equips them to optimize communication.<sup>[6]</sup>

Cataracts are one of the most common diseases in ophthalmology. Cataract surgeries are considered one of the safest surgical procedures.<sup>[7]</sup> However, despite the advancements in this surgery, malpractices and/or avoidable medical complications are often reported.<sup>[8]</sup> While SBAR has successfully been implemented in various health-care settings,<sup>[9,10]</sup> data regarding its implementation and impact in ophthalmology settings, and specifically cataract surgery, are limited. Therefore, this study was conducted to evaluate the impact of implementing SBAR on nurse–physician communication and on the safety and satisfaction of patients undergoing cataract surgery.

## MATERIALS AND METHODS

### Setting, study design and participants

This cross-sectional study was conducted in the Ophthalmology Department of Zhongshan Hospital, Xiamen University, Xiamen, China, from April 2016 to December 2018 and included nurses and physicians undertaking, and patients undergoing, cataract surgery. Between March 2015 and February 2016, the highest number of medical complications and malpractices in our hospital were reported from the Ophthalmology Department ( $N = 13$ ), and thus this department was chosen for conducting the study.

The study was provided an exemption from review by the Institutional Review Board of Zhongshan Hospital, Xiamen University (Ref. no.: ZHXU-2016-008). All respondents were assured of anonymity and data confidentiality.

### Course implementation

Participation in the SBAR Collaborative Communication Education course was made mandatory for all nurses and physicians in the ophthalmology ward. This study broadly followed the methods used by Ting *et al.*<sup>[11]</sup> The course was first provided in April 2016 as a 1-h session by experienced ophthalmologists during a monthly department meeting. Then, the course was repeated once every 2 months for the next 2 years.

The session was divided into a 30-min lecture (which were tailored to suit the requirements of nurses and identify communication problems between nurses and physicians), a 10–15 min case-based discussion, and a video demonstration (obtained from educational web resources for demonstrating comparison between communication using traditional methods and SBAR technique).

Thereafter, nurses were requested to always complete the SBAR handover list that had been customized for reporting any abnormal findings during cataract surgeries and placed next to a telephone in the ward station of the operating room. In addition, nurses were encouraged to communicate with physicians for clarifying unclear orders.

### Physician–nurse communication satisfaction questionnaire

In March 2016, that is, before the implementation of the first SBAR course, all participating nurses and physicians answered a nurse–physician or physician–nurse CSQ, which was a modified version of the questionnaire used by Sears *et al.*<sup>[12]</sup> The questionnaire was again completed 1- and 2-year post-SBAR implementation (in December 2017 and 2018, respectively).

The CSQ evaluates nurse or physician satisfaction with physician–nurse communication using six parameters: (1) order correction rate; (2) communication of a patient's condition; (3) safety techniques; (4) nurse–physician collaboration; (5) management perception; and (6) emergent management. Each item was answered on a 5-point Likert scale, with 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly agree. The internal consistency of the questionnaire using Cronbach's  $\alpha$  was 0.82 (95% CI: 0.79–0.86).

### Patient satisfaction questionnaire

All patients who underwent cataract surgery, consented to participate, and completed the patient satisfaction questionnaire from May 1, 2015, to April 30, 2016, and January 1, 2017, to December 31, 2018, were included in the study. Patients who responded between May 2015 and April 2016

were categorized in the pre-implementation group; January 1 and December 31, 2017, in the 1-year post-implementation group; and January 1 and December 31, 2018, in the 2-year post-implementation group. The questionnaire was completed by all participating patients before discharge.

The six-item patient satisfaction questionnaire elicited data regarding the following domains: (1) health education, (2) medical process, (3) medical quality, (4) service attitudes, (5) nursing quality, and (6) medical ethics. The items were scored on a 5-point Likert scale, with 1 = Strongly dissatisfied, 2 = Dissatisfied, 3 = Neutral, 4 = Satisfied, and 5 = Strongly satisfied. The internal consistency of the questionnaire using Cronbach's  $\alpha$  was 0.85 (95% CI: 0.78–0.93).

### Medical complications and malpractices

The total number of medical complications and malpractices were recorded before implementation and at 1 and 2 years after implementation, as defined previously. The medical complications of cataract surgery include posterior capsule opacity,<sup>[13]</sup> intraocular lens dislocation, eye inflammation, light sensitivity, photopsia, macular edema, ptosis, and ocular hypertension.<sup>[14]</sup> Medical malpractice was defined as a negligence resulting in an injury to a patient.<sup>[15]</sup> Data regarding negligence and malpractices were obtained from the Ethics Committee in Zhongshan Hospital, which records all occurrences of negligence, including surgical, diagnostic, medication, devices and equipment, and system failure negligence as well as infection and fall caused due to negligence.

### Statistical analysis

The baseline data were analyzed using descriptive statistics such as means and standard deviations (SD), absolute numbers, and percentages. Continuous variables were compared using Student's *t*-test and categorical variables using chi-square test or Fisher's exact test, when necessary. The Wilcoxon signed-rank test was used to perform pre-implementation and post-implementation comparisons over time. Changes in the number of medical complications and malpractices were examined by Wilcoxon rank sum test, which is used for small numbers and non-normal distributions. *P* values <0.05 were considered statistically significant. All statistical calculations were performed using Statistical Package for the Social Science version 25 (IBM Corp., Armonk, NY, USA).

## RESULTS

### Participant characteristics

In total, 10 nurses and 6 physicians completed all three surveys. In addition, 1215 patients undergoing cataract surgery

completed the questionnaire: 358 in the pre-implementation phase, 425 in the 1-year post-implementation, and 432 in the 2-year post-implementation. There were no significant differences in the baseline data of the three patient groups [Table 1].

### Outcome of the pre- and post-implementation surveys

The physician–nurse communication scores improved in both the 1- and 2-year post-implementation surveys compared with the pre-implementation survey [Table 2]. There were significant increase in patient satisfaction scores between the pre- and post-implementation periods ( $P < 0.01$ ) [Table 3]. The total number of medical complaints and malpractices showed a significant decrease in the 2-year post-implementation period compared with those in the pre-implementation period [Table 4].

## DISCUSSION

This study found that the mean score of the satisfaction with physician–nurse communication in cataract surgeries improved after the implementation of the SBAR communication technique (from a total pre-implementation mean score of 78.97 to 94.97 after the second implementation of SBAR). This, in turn, also resulted in higher patient satisfaction and a decrease in medical complications/malpractices in patients undergoing cataract surgery. These findings are coherent with those of studies in different hospital departments where SBAR Collaborative Communication Education courses had been implemented.<sup>[9–11]</sup>

In the study by Achrekar *et al.*,<sup>[9]</sup> implementation of SBAR was shown to help nurses be more focused and it eased their communication during handovers. Similarly, Ting *et al.*<sup>[11]</sup> found that SBAR implementation had a positive effect on obstetric nurses with regards to job satisfaction, working conditions, safety climate, and teamwork. Given that effective teamwork and communication are absolute requirements for high-quality patient care,<sup>[2]</sup> continuous training for physicians and nurses to reinforce the importance of communication techniques such as the SBAR is essential.

Higher patient satisfaction and lower medical complications/malpractices have been shown to be interconnected with improved communication, as was also noted in our study.<sup>[16]</sup> Similarly, in a retrospective study that included total hip arthroplasty patients, Delanois *et al.* reported a significantly positive association between patient satisfaction and their communication with nurses and physicians. Increased care provider–patient interaction has also been shown

**Table 1: Baseline characteristics of the patients for the pre- and post-implementation surveys**

Variables	Preimplementation (n=358)	1-year Postimplementation (n=425)	2-year postimplementation (n=432)	P*	P**
Age (mean±SD)	65.0±7.8	65.8±6.9	64.9±8.5	0.1283	0.8644
Male/female	182/176	221/204	234/198	0.746	0.351
Comorbidities, n (%)					
Hypertension	245 (68.4)	285 (67.2)	285 (66.8)	0.681	0.463
DM	115 (32.1)	137 (32.3)	139 (32.2)	0.973	0.987
CVD	31 (8.6)	38 (8.9)	37 (8.5)	0.890	0.962
CVA	20 (5.5)	26 (6.2)	24 (5.6)	0.753	0.985
Dyslipidemia	139 (38.9)	170 (39.9)	165 (38.1)	0.738	0.856
Dementia	17 (4.8)	17 (4.0)	24 (5.6)	0.609	0.611

\*Comparison of baseline characteristics between preimplementation and 1-year postimplementation period according to Student's *t*-test or Chi-square test; \*\*Comparison of baseline characteristics between preimplementation and 2-year postimplementation period according to Student's *t*-test or Chi-square test. Preimplementation period: From April 2016 to December 2016; 1<sup>st</sup> postimplementation period: From January 2017 to December 2017; and 2<sup>nd</sup> postimplementation period: From January 2018 to December 2018. SD - Standard deviation; DM - Diabetes mellitus; CVA - Cerebrovascular attack; CVD - Cardiovascular disease

**Table 2: Communication satisfaction questionnaire score of physicians and nurses<sup>a</sup>**

Period	Total score	Physician-nurse CSQ score (n=6)	Nurse-physician CSQ score (n=10)
Preimplementation	78.97±4.79	78.32±4.21	79.62±5.37
1-year postimplementation	85.35±6.31*	85.27±5.73*	85.42±6.89*
2-year postimplementation	94.97±5.32**	94.51±5.21**	95.42±5.43**

\*Comparison of the CSQ score between preimplementation and 1-year postimplementation period,  $P < 0.01$ ; \*\*Comparison of the CSQ score between preimplementation and 2-year postimplementation period,  $P < 0.01$ ; <sup>a</sup>Post hoc analysis among the groups using the Wilcoxon rank-sum test. CSQ - Communication satisfaction questionnaire

**Table 3: Patient satisfaction questionnaire scores in pre- and post-implementation periods<sup>a</sup>**

Time period	Total score	PSQ score	
		Outpatient	Inpatient
Preimplementation (n=358)	79.03±6.27	79.56±5.21	78.49±7.32
1-year postimplementation (n=425)	85.55±5.60*	85.47±4.93*	85.63±6.27*
2-year postimplementation (n=432)	95.74±4.75**	96.21±4.38**	95.27±5.12**

\*Comparison of the PSQ score between preimplementation and 1<sup>st</sup> postimplementation period,  $P < 0.01$ ; \*\*Comparison of the PSQ score between preimplementation and 2<sup>nd</sup> postimplementation period,  $P < 0.01$ ; <sup>a</sup>Post hoc analysis among the groups using the Wilcoxon rank-sum test. PSQ - Patient's satisfaction questionnaire

**Table 4: Medical complications and malpractices in cataract surgery in pre- and post-implementation periods**

Time period	Number of medical complications (%)	Number of medical malpractices (%)
Preimplementation	8 (2.2)	5 (1.4)
1-year postimplementation	5 (1.2)*	2 (0.5)*
2-year postimplementation	1 (0.2)**	0

\*Comparison of the number of medical complication or malpractice between preimplementation and 1<sup>st</sup> postimplementation period,  $P > 0.05$ ; \*\*Comparison of the number of medical complications between preimplementation and 2-year postimplementation period,  $P < 0.05$

to reduce the number of preventable medical events and malpractice.<sup>[17]</sup> In contrast, a study found no association

between patient satisfaction and changes in modifiable cardiovascular risks.<sup>[18]</sup> These contrasting findings indicate that the positive association between patient–physician communication may change across different hospital settings and/or the communication technique.<sup>[19]</sup>

### Strengths and limitations

To the best of the authors' knowledge, this is the first study reporting the impact of implementing SBAR communication techniques in an ophthalmology setting. However, there are a few limitations such as the observational study design, owing to which the associations cannot be defined as causative. In addition, changes in variables could not be studied over an extended period. Therefore, a long-term randomized controlled study would help demonstrate the exact effects of SBAR on satisfaction with physician–nurse communication, patient satisfaction, medical complications, and malpractices in patients undergoing cataract surgery.

### CONCLUSION

The SBAR technique is a potential tool for enhancing nurse–physician communication and for improving the safety and satisfaction of patients undergoing cataract surgery.

### Ethical considerations

This study was approved with “exempt review” by the Institutional Review Board of Zhongshan Hospital Xiamen University (Ref. no.: ZHXU-2016-008) on March 10, 2016. All participants in the study provided informed consent and were assured of anonymity and data confidentiality. The study adhered to the Declaration of Helsinki, 2013.

### Data availability statement

The datasets generated during and/or analyzed during the current study are not publicly available, but are available from the corresponding author on reasonable request.



**Peer review**

This article was peer-reviewed by two independent and anonymous reviewers.

**Financial support and sponsorship**

Nil.

**Conflicts of interest**

There are no conflicts of interest.

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