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
INTRODUCTION

The exchange of patient care information between nurses and physicians occurs daily. The handover process is a crucial step in daily clinical practice. It is vital that nurses have access to standardized communication tools to ensure effective transfer of patient information to physicians. 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.

Cataracts are one of the most common diseases in ophthalmology. Cataract surgeries are considered one of the safest surgical procedures. However, despite the advancements in this surgery, malpractices and/or avoidable medical complications are often reported. While SBAR has successfully been implemented in various health-care settings, 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. 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. 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 α 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,[13] intraocular lens dislocation, eye inflammation, light sensitivity, photopsia, macular edema, ptosis, and ocular hypertension.[14] Medical malpractice was defined as a negligence resulting in an injury to a patient.[15] 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 finding are coherent with those of studies in different hospital departments where SBAR Collaborative Communication Education courses had been implemented.[9–11]

In the study by Achrekar et al,[9] implementation of SBAR was shown to help nurses be more focused and it eased their communication during handovers. Similarly, Ting et al[15] 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,[30] 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.[10] 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)                       | 0.576    | 0.463     |
| DM                         | 155 (32.1)                | 177 (32.3)                       | 199 (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; 1st postimplementation period: From January 2017 to December 2017; and 2nd 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

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

| 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 1st postimplementation period, P<0.01; **Comparison of the PSQ score between preimplementation and 2nd postimplementation period, P<0.01; *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 1st postimplementation period, P>0.05; **Comparison of the number of medical complications between preimplementation and 2-year postimplementation period, P<0.05

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.

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Conflicts of interest
There are no conflicts of interest.

REFERENCES
1. Friensen MA, White SV, Byers JF. Handoffs: Implications for nurses. In: Patient Safety and Quality: An Evidenced Based Handbook for Nurses. Vol. 45, Ch. 34. Rockville (MD): Agency for Healthcare Research and Quality (US); 2008. p. 285-332.
2. Leonard M, Graham S, Bonacum D. The human factor: The critical importance of effective teamwork and communication in providing safe care. Qual Saf Health Care 2004;13 Suppl 1:i85-90.
3. Marshall S, Harrison J, Flanagan B. The teaching of a structured tool improves the clarity and content of interprofessional clinical communication. Qual Saf Health Care 2009;18:137-40.
4. Gröndahl W, Muurinen H, Katajisto J, Suohon R, Leino-Kilpi H. Perceived quality of nursing care and patient education: A cross-sectional study of hospitalised surgical patients in Finland. BMJ Open 2019;9:e023108.
5. Beckert CD, Kipnis G. Collaborative communication: Integrating SBAR to improve quality/patient safety outcomes. J Healthc Qual 2009;31:19-28.
6. Urquhart C, Currell R, Grant MJ, Hardiker NR. WITHDRAWN: Nursing record systems: Effects on nursing practice and healthcare outcomes. Cochrane Database Syst Rev 2018;5:CD002099.
7. Raczyńska D, Głąsner I, Serkies-Minuth E, Wujtewicz MA, Mirrosc K. Eye surgery in the elderly. Clin Interv Aging 2016;11:407-14.
8. Engelhard SB, Salek SS, Justin GA, Sim AJ, Worera FA, Reddy AK. Malpractice litigation in ophthalmic trauma. Clin Ophthalmol 2020;14:1979-86.
9. Achrekar MS, Murthy V, Kanan S, Shetty R, Nair M, Khattry N. Introduction of situation, background, assessment, recommendation into nursing practice: A prospective study. Asia Pac J Oncol Nurs 2016;3:45-50.
10. Ashcraft AS, Owen DC. Comparison of standardized and customized SBAR communication tools to prevent nursing home resident transfer. Appl Nurs Res 2017;38:64-9.
11. Ting WH, Peng FS, Lin HH, Hsiao SM. The impact of situation-background-assessment-recommendation (SBAR) on safety attitudes in the obstetrics department. Taiwan J Obstet Gynecol 2017;56:171-4.
12. Sears K, Lewis ST, Craddock MD, Flowers BR, Bovic LC. The evaluation of a communication tool within an acute healthcare organization. J Hosp Adm 2014;3:79-87.
13. Louison S, Blance J, Pallot C, Allassane S, Pradel A, Bron AM, et al. Visual outcomes and complications of congenital cataract surgery. J Fr Ophthalmol 2019;42:368-74.
14. Turalba A, Payal AR, Gonzalez-Gonzalez LA, Cakiner-Egilmez T, Chomsky AS, Vollman DE, et al. Cataract surgery outcomes in glaucomatous eyes: Results from the Veterans affairs ophthalmic surgery outcomes data project. Am J Ophthalmol 2015;160:693-701.e1.
15. Özdemir MH, Can İO, Koçak N. Malpractice claims in ophthalmology: A 10-year review. Turk Oftalmoloji Gazetesi 2014;44:1-5.
16. Archiopoli A, Ginosar T, Wilcox B, Avila M, Hill R, Oetzel J. Factors of interpersonal communication and behavioral health on medication self-efficacy and medication adherence. AIDS Care 2016;28:1607-14.
17. Delanois RE, Gwam CU, Mistry JB, Chuangtai M, Khlopas A, Yakubek G, et al. Does gender influence how patients rate their patient experience after total hip arthroplasty? Hip Int 2018;28:40-3.
18. Norhayati MN, Masseni AA, Azlina I. Patient satisfaction with doctor-patient interaction and its association with modifiable cardiovascular risk factors among moderately-high risk patients in primary healthcare. Peerj 2017;5:e2983.
19. Cook M, Zonies D, Brasel K. Prioritizing communication in the provision of palliative care for the trauma patient. Curr Trauma Rep 2020;6:183-93.