



# Implementation of an SBAR communication program based on experiential learning theory in a pediatric nursing practicum: A quasi-experimental study

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## ABSTRACT

**Background:** Effective communication by nurses is crucial to ensure patient safety. A structured communication program increases communication clarity, education satisfaction, and positivity during interprofessional collaboration among students. In an effort to facilitate effective communication between nurses and physicians, the well-known structured communication tool SBAR (Situation, Background, Assessment, and Recommendation) has been extensively used in clinical and educational settings.

**Objectives:** The purpose of the study is to investigate the impact of an SBAR communication program on communication performance, perception, and practicum-related outcomes in senior-year nursing students.

**Method:** The study employed a non-equivalent control group quasi-experimental design and implemented the tool in the pediatric nursing practicum of a nursing school. The experimental group participated in a SBAR program, where role playing using SBAR techniques for different scenarios was used to improve practical communication among nursing students. The SBAR program was developed based on Kolb's Experiential Learning Theory. Communication performance was assessed via the SBAR communication tool and the communication clarity scale. Communication perception was measured by handover confidence level. Practicum-related outcomes of clinical practice self-efficacy, perceived nurse–physician collaboration, and practicum satisfaction, were also evaluated.

**Results:** The experimental group demonstrated significantly higher SBAR communication ( $p < .001$ ), communication clarity ( $p < .001$ ), and handover confidence ( $p < .001$ ) than the control group. Clinical practice self-efficacy, perceived nurse–physician collaboration, and practicum satisfaction did not differ.

**Conclusions:** The SBAR program in a pediatric nursing practicum improves SBAR communication, communication clarity, and perceived handover confidence in senior-year nursing students.

## 1. Introduction

Collaborative practice in clinical settings is essential for achieving optimal patient outcomes (World Health Organization, 2010). Effective communication between nurses and physicians leads to the provision of comprehensive services for patients (Lancaster et al., 2015). Communication performance has been considered by several organizations to be one of the crucial outcomes of nursing education (Australian Nursing and Midwifery Federation, 2014; Society of Pediatric Nursing, 2017). However, unclear and imprecise communication is common among healthcare personnel (Tang et al., 2013). A lack of professional communication and collaboration may be one of the main causes of medication errors (Farzi et al., 2017).

Simulations are increasingly used to improve the practical capacity

of students in various nursing education programs. Until now, simulation-based education regarding communication has focused mainly on communication between clinicians and patients (Kaploniy et al., 2017; MacLean et al., 2017). Notably, it has been found that nursing students experienced difficulties in notifying doctors of patients' health problems in the pediatric nursing practicum (Bowling, 2015). Moreover, nursing reported moderate to severe stress from simulation education, which may be related to critiques by faculty and peers (Cantrell et al., 2017). These reports indicate the limitations of excessive pedagogical dependency on simulation-based approaches to communication education.

Furthermore, the Korean Accreditation Board of Nursing Education (2017) only accepts simulation classes for 12% of the 1000 required practical hours; the greater part of the clinical nursing course is practica

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in hospitals, which largely focus on case reports reflecting the nursing process, and have been criticized for their limited approach to real practice in South Korea (Shin et al., 2017). Therefore, strengthening interdisciplinary communication programs linked to hospital clinical practica is needed in order to improve the practical capacity of nursing schools.

### 1.1. Literature review

#### 1.1.1. Standardized communication tool

In an effort to facilitate effective communication between nurses and physicians, SBAR (Situation, Background, Assessment, and Recommendation), a well-known structured communication tool, has been extensively used in clinical and educational settings (Buckley et al., 2016; Compton et al., 2012). SBAR communication should include the patients' current problems (Situation), medical history (Background), current symptoms and vital signs (Assessment), and nurses' recommendations (Recommendation). The SBAR educational program improves communication performance among nurses (Chaharsoughi et al., 2014); in addition, it increases communication knowledge (Wang et al., 2015), communication clarity (Yu and Kang, 2017), and attitude of interprofessional collaboration (Kostoff et al., 2016) among nursing students.

#### 1.1.2. Application of experiential learning theory and role play in communication programs

Lisko and O'Dell (2010) developed a medical-surgical course including clinical experience in the nursing laboratory, skill demonstration, scenario-based presentation, and reflection, based on Kolb's experiential learning theory. The experiential learning theory emphasizes the experiential aspect of the learning process; hence, it seeks to continuously change the experiences of the student. This ongoing educational process of alternating the student's experiences help build their knowledge and influence schema (Kolb, 1984). An educational communication program based on experiential learning theory should be considered by nursing educators. Virtual environments and role play using scenarios could allow students to train themselves according to real nurses' roles. Scenario-based learning has been shown to enhance the attitude of nursing students (Richardson et al., 2017). Role play is also an experiential learning technique for introducing learners to behave appropriately in various situations, as it provides them with targeted practice and feedback to acquire and improve skills and integrate new information (Joyner and Yound, 2006). Role play has been shown to be one of the most effective strategies in education for helping students learn how to communicate with each other (Chan, 2012; Yu and Kang, 2017).

Therefore, this study aimed to evaluate whether an SBAR communication program based on experiential learning increased nursing students' communication performance, communication perception, and practicum-related outcomes.

## 2. Methods

### 2.1. Research design

A quasi-experimental non-equivalent control group pretest and posttest design was implemented in a pediatric nursing practicum.

The experimental group participated in the SBAR communication program, composed of instruction in the SBAR technique, scenarios, and role playing, while the control group received the usual practicum education. The four-phase program was conducted within 2 weeks from pre-practicum orientation, before the one-week practicum, to the conference after the finish of the practicum. The impact of the program on communication performance, communication perception, and practicum-related outcomes was evaluated using instruments to measure communication, communication clarity, handover confidence,

practicum satisfaction, clinical practice self-efficacy, and nurse–physician collaboration through comparison of pretest and posttest in both groups.

### 2.2. Settings and participants

The programs were delivered through a pediatric nursing practicum for a bachelor of nursing course at a university in South Korea. In a previous study, the effect size was 0.7 (Noh et al., 2016). An  $\alpha$  of 0.05 and power of 0.9 meant that an adequate sample size was 36 per group using G\*Power. The study involved a total 81 participants, with 41 students in the control group and 40 students in the experimental group. The achieved actual power was 0.928.

### 2.3. The SBAR communication program

#### 2.3.1. Development of the SBAR program

The SBAR communication program was developed based on experiential learning theory (Kolb, 1984). New knowledge transformed from experience into a cognitive framework can induce ideas in students to solve problems and perform new skills. The learning process has four phases: concrete experience, reflection, abstract conceptualization, and active experimentation (Kolb, 1984). We viewed pre-practicum orientation based on scenario-based learning as the concrete experience stage, which relies on open-mindedness. This was followed by giving the students reflective experiences of communication between nurses and physicians in the real world through articulating SBAR components of communication situations in clinical settings and analyzing their relevance. Subsequently, the abstract conceptualization stage comprised presenting students with situations in clinical settings and asking them to identify gaps between theory and practice regarding SBAR. In the final stage, an active experiment was implemented for virtual patients, using scenarios and real patients in clinical settings.

The SBAR communication program development process consisted of three phases, including a literature review, development of scenarios, and evaluation of scenarios (Table 1). The program was composed of a pediatric nursing practicum with an additional four-hour course based on existing literature (Bowling, 2015; McCaffrey et al., 2012; Yu and Kang, 2017). Five scenarios involving common pediatric health problems were developed by a faculty with 15-years' experience in pediatric clinical practice. Three were modified from previously developed scenarios for students in a pediatric nursing practicum (Kim et al., 2017). Two scenarios were newly developed. Two pediatric nursing professionals reviewed the contents of the scenarios. The experimental group students participated in the SBAR communication program in a pediatric nursing practicum. The program was conducted according to the experiential learning theory's stages and provided students with guidelines regarding the program process.

### 2.4. Procedures

The SBAR program was delivered to each practicum team for a one-week pediatric nursing practicum and an additional four-hour course. A class of senior nursing students was divided into A class and B class. A class was set as the experimental group and B class was set as the control group. Six teams per class were composed of 6 or 7 nursing students. The program was facilitated in the conference room of the school and at the hospital. One practicum instructor facilitated the program, introducing the SBAR technique, providing scenarios to students, checking students' SBAR cases, and guiding students' role plays.

The program was delivered in four phases, starting one week after the orientation of the hospital practicum and pretest. The first phase developed concrete experience in a clinical setting using scenarios. The instructor lectured on the SBAR technique; the lecture included the importance of interprofessional communication, what SBAR is, how we

**Table 1**  
SBAR communication program.

Learning process <sup>a</sup>	Practicum day	Contents	Methods	Duration
	Pretest	Scenario I	Pretest	
[1] Concrete experience	Orientation	SBAR orientation Scenario I Scenario II	Small group teaching Discussion Role-plays	1.5 h
[2] Reflective observation	Day 1-2	SBAR experience	Observing SBAR in clinical settings	2 days
[3] Abstract conceptualization	Day 3	Clinical SBAR case I Scenario III	Role-plays Providing feedback Small group teaching Discussion	1 h
	Day 4-5	SBAR experience	Observing SBAR in clinical settings	3 days
[4] Active experimentation	Conference	Clinical SBAR case II Scenario IV	Role-plays Providing feedback Small group teaching Discussion	1.5 h
	Posttest	Scenario V	Posttest	

<sup>a</sup> The learning process was based on experiential learning theory (Kolb, 1984). Scenarios included the following health problems: bronchiolitis with desaturation, febrile convulsion, constipation, ventricular septal defect with heart failure, and acute gastroenteritis with severe dehydration.

can communicate using the SBAR tool, and the first scenario. Students practiced by role playing SBAR communication using the second scenario, about patients with constipation. The instructor informed students of an assignment about nurses' SBAR cases in which they should engage in observations in the hospital unit for the practicum of the next week.

In the second phase, on practicum days 1 and 2, was carried out to allow the reflective observation element of experiential learning. Students were observing the use of SBAR in the clinical setting on their own. They were taught to recognize how SBAR is used in the clinical setting, experience professional medical communication in the real world, and reflect on components omitted in the SBAR case in this practical setting. In addition, they were given the task of listening to and organizing nurses' communication content using the SBAR tool.

The third phase, on practicum day 3, was delivered during an instructor's visit to the clinical setting. Two to four students engaged in role play regarding each SBAR case and shared other students' cases. Students role played being a clinical nurse notifying the doctor about the patient's status. The instructor gave students feedback regarding the adequacy and significance of the SBAR case in each situation. Students were trained in the third scenario, about patients with febrile convulsion. Finally, the instructor helped students to understand gaps between theory and practice using both case presentations and scenarios to support their abstract conceptualization, because some SBAR components were frequently omitted. The instructor informed students of second assignment, on other SBAR cases.

In the fourth phase, on practicum days 3 and 4, students again observed the use of SBAR on their own in the clinical setting. They actively experienced SBAR cases in the real clinical world and prepared second SBAR cases in their hospitals during the remaining hospital practicum days. Then, during the practicum conference after the hospital practicum ended, all team members participated in role plays

regarding their cases and received feedback from the instructor. Students applied SBAR using the fourth scenario, about a patient with congestive heart failure, as an active experimentation phase. In contrast, the control group students learned regular nursing processes and therapeutic communication with patients and family, in only 30 min.

## 2.5. Data collection

The data were collected from February through June 2018. For a pretest, participants filled out questionnaires. Then, audio recordings using the bronchiolitis scenario were conducted after the end of general orientation to the practicum. The posttest was conducted using the same questionnaires, and audio recordings were made using the scenario of patients with acute gastroenteritis following the end of the program.

## 2.6. Study variables and instruments

### 2.6.1. Communication performance

SBAR communication was measured using an instrument to assess the accuracy with which nursing students reported patient information to physicians that employed the SBAR tool regarding patients' problem (Yu and Kang, 2017). This scale contained 12 items in four categories: Situation, Background, Assessment, and Recommendation. Each item in the tool was rated on a three-point Likert-type scale, with higher scores indicating greater reporting accuracy. Two raters completed the evaluation tool regarding SBAR communication. The Cohen's kappa with linear weighting (a measure of inter-rater reliability for ordinal categories) (Parker et al., 2013) was 0.736 (95% confidence interval [CI] 0.621–0.851). Kappa values of 0.61–0.80 indicate good agreement (Landis and Koch, 1977).

Communication clarity was measured using the interprofessional

clinical communication tool (Marshall et al., 2009). The scale consisted of eight questions with a five-point Likert scale. The Cohen's kappa with quadratic weighting (a measure of inter-rater reliability for five ordinal categories) between the two raters was 0.724 (95% CI 0.483–0.964).

2.6.2. Communication perception

Handover confidence was assessed using a visual analog scale (VAS), with a higher score indicating stronger confidence (Yu and Kang, 2017).

2.6.3. Practicum-related outcomes

Practicum satisfaction was also evaluated using a VAS, between 0 (dissatisfied) and 10 (fully satisfied). Perceived nurse–physician collaboration level was evaluated using a Korean version of the nurse–physician collaboration scale, including 27 questions measured on a five-point Likert scale (Mun, 2015). Cronbach's  $\alpha$  value was 0.91.

Clinical practice self-efficacy through the practicum was measured using a Korean version of the learning self-efficacy scale to assess the individuals' perception related to trying new things, including 10 items with a seven-point Likert scale (Park and Kweon, 2012). Cronbach's  $\alpha$  value was 0.93.

2.7. Data analysis

Descriptive statistics, such as mean and percentage, were used to assess participants' characteristics. We conducted chi-squared tests and independent t-tests to examine the homogeneity of the groups and used an independent t-test for comparison of outcomes between the control and experimental groups using SPSS Statistics 24.0.

2.8. Ethical considerations

This study was performed after receiving approval from the institutional review board of D Hospital. The students were informed of the need, purpose, and methods of this study by the researcher and voluntarily participated in this research.

Table 2  
Participants' demographics.

Variables	Categories	Total (n=81) N(%) or M $\pm$ SD	Exp (n=40) N(%) or M $\pm$ SD	Cont (n=41) N(%) or M $\pm$ SD	t or Chi-square	p
Age		22.32 $\pm$ 2.43	22.65 $\pm$ 21.97	22.65 $\pm$ 2.93	1.26	0.209
Gender	Female	73 (90.1)	38 (95.0)	35 (85.4)	2.11	0.264
	Male	8 (9.9)	2 (5.0)	6 (14.6)		
Religion	Yes	32 (39.5)	14 (35.0)	18 (43.9)	1.77	0.621
	No	49 (60.5)	26 (65.0)	23 (56.1)		
Attendance of communication class	Yes	46 (56.8)	25 (62.5)	21 (51.2)	1.05	0.372
	No	35 (43.2)	15 (37.5)	20 (48.8)		
Activity of club or student council	Yes	51 (63.0)	27 (67.5)	24 (58.5)	0.69	0.492
	No	30 (37.0)	13 (32.5)	17 (41.5)		
Satisfaction of theory subjects	Not satisfied at all	0	0	0	-0.90	0.367
	Not satisfied	1 (1.2)	0	1 (2.4)		
	Neutral	21 (25.9)	9 (22.5)	12 (29.3)		
	Satisfied	53 (65.4)	28 (70.0)	25 (61.0)		
	Very satisfied	6 (7.4)	3 (7.5)	3 (7.3)		
Satisfaction of clinical practice	Not satisfied at all	0	0	0	-0.86	0.392
	Not Satisfied	2 (2.5)	0	2 (4.9)		
	Neutral	25 (30.9)	12 (30.0)	13 (31.7)		
	Satisfied	50 (61.7)	26 (65.0)	24 (58.5)		
	Very satisfied	7 (8.6)	2 (5.0)	5 (4.9)		
Average academic grade	< 2.5	5 (6.2)	1 (2.5)	4 (9.8)	3.98	0.408
	2.5–3.0	27 (33.3)	7 (17.5)	20 (48.8)		
	3.0–3.5	30 (37.0)	14 (35.0)	16 (39.0)		
	> 3.5	19 (23.5)	18 (45.0)	1 (2.4)		
Experience of hospital visiting program	Yes	3 (3.7)	1 (2.5)	2 (4.9)	0.32	> 0.999
	No	78 (96.3)	39 (97.5)	39 (95.1)		
Experience of hospital internship	Yes	6 (7.4)	1 (2.5)	5 (12.2)	2.77	0.096
	No	75 (92.6)	39 (97.5)	36 (87.8)		

3. Results

The students in the experimental group were similar in demographics to those in the control group (Table 2).

The results indicated that students in the experimental group reported significantly higher SBAR communication, communication clarity, and handover confidence compared to students in the control group. Clinical practice self-efficacy, perceived nurse–physician collaboration, and practicum satisfaction did not differ between the groups.

There was a significant increase in SBAR communication, with scores of 17.65  $\pm$  3.16 for the experimental group and 9.02  $\pm$  2.52 for the control group at posttest ( $p < .001$ ). Moreover, there was a significant difference in all domains' scores between two groups. In the control group, the mean differences between posttest and pretest scores of subscales were 1.02–0.56. In the experimental group, differences between posttest and pretest scores of subscales were 1.55–2.87 (Table 3).

Students showed a significant increase in communication clarity at posttest, with scores of 29.90  $\pm$  3.32 for the experimental group and 22.41  $\pm$  2.24 for the control group ( $p < .001$ ) (Table 3).

There were significant differences in handover confidence at posttest, with reporting scores of 6.05  $\pm$  1.63 in the experimental group and 5.14  $\pm$  1.81 in the control group ( $p < .001$ ) (Table 4).

There were no significant differences in the practicum satisfaction between the two groups: 7.92  $\pm$  1.54 in the experimental group and 7.46  $\pm$  1.50 in the control group ( $p = .876$ ). There were no significant differences in the clinical practice self-efficacy: 59.52  $\pm$  6.64 score in the experimental group and 56.87  $\pm$  6.87 score in the control group ( $p = .109$ ). The nurse–physician collaboration was 101.47  $\pm$  10.73 in the experimental group and 98.00  $\pm$  12.47 in the control group ( $p = .904$ ) (Table 4).

4. Discussion

The SBAR communication program included effective components, such as scenario and role play on nursing education, as well as SBAR

**Table 3**  
Comparisons of SBAR communication and communication clarity between the two groups.

Variables	Categories	Range	Groups	Pre-test (M ± SD)	Post-test (M ± SD)	t or F	p
SBAR communication	S	0–6	Exp (n = 40)	3.47 ± 1.35	5.02 ± 1.04	-5.25	< 0.001
			Cont (n = 41)	3.68 ± 1.57	3.60 ± 1.44		
	B	0–6	Exp (n = 40)	0.95 ± 1.01	3.82 ± 1.81	-6.25	< 0.001
			Cont (n = 41)	0.74 ± 0.97	1.29 ± 1.28		
	A	0–10	Exp (n = 40)	5.00 ± 1.66	6.97 ± 1.74	-6.04	< 0.001
			Cont (n = 41)	5.02 ± 1.75	4.00 ± 1.58		
R	0–2	Exp (n = 40)	0.05 ± 0.22	1.82 ± 0.44	-16.98	< 0.001	
		Cont (n = 41)	0.14 ± 0.52	0.12 ± 0.33			
Total		0–24	Exp (n = 40)	9.47 ± 2.43	17.65 ± 3.16	-11.18	< 0.001
			Cont (n = 41)	9.58 ± 2.67	9.02 ± 2.52		
Communication clarity	Total	0–40	Exp (n = 40)	22.40 ± 2.20	29.90 ± 3.22	-12.11	< 0.001
			Cont (n = 41)	22.98 ± 3.00	22.41 ± 2.24		

S, Situation; B, Background; A, Assessment; R, recommendation.

**Table 4**  
Comparisons of handover confidence, practicum satisfaction, clinical practice self-efficacy, and perceived nurse-physician collaboration between the two groups.

Variables	Groups	Pre-test (M ± SD)	Post-test (M ± SD)	M (df) ± SD	t	p
Handover confidence	Exp (n = 40)	4.27 ± 1.73	6.05 ± 1.63	1.77 ± 1.84	-4.40	< 0.001
	Cont (n = 41)	5.02 ± 1.73	5.14 ± 1.81	0.12 ± 1.51		
Practicum satisfaction	Exp (n = 40)	7.25 ± 1.72	7.92 ± 1.54	0.67 ± 2.20	-0.15	0.876
	Cont (n = 41)	6.85 ± 1.31	7.46 ± 1.50	0.60 ± 1.48		
Clinical practice self-efficacy	Exp (n = 40)	55.0 ± 7.92	59.52 ± 6.64	4.52 ± 7.36	-1.62	0.109
	Cont (n = 41)	55.18 ± 8.64	56.87 ± 6.87	1.69 ± 8.33		
Nurse-physician collaboration	Exp (n = 40)	97.30 ± 10.29	101.47 ± 10.73	4.17 ± 13.44	-0.12	0.904
	Cont (n = 41)	94.16 ± 11.67	98.00 ± 12.47	3.83 ± 11.87		

tools. Both scenarios and role play are extensively used in various nursing curricula and these strategies have various advantages in students' learning (Richardson et al., 2017; Thomas et al., 2009; Yu and Kang, 2017). Chaharsoughi et al. (2014) carried out the SBAR program with role plays for nurses. We included common childhood health problems, such as respiratory and febrile disease. Scenarios pertaining to major health problems could help nursing students improve their clinical capacity because they cannot experience all clinical situations in the hospital practicum. In addition, the introduction of SBAR before the practicum could enhance students' interests in nurse-physician communication. Clarity and precision of message are important for effective interprofessional communication (Robinson et al., 2010).

The SBAR communication program was implemented in a pediatric nursing practicum. The use of scenarios and observation of SBAR communication in clinical settings provided concrete experience to the students, helping them to understand communication problems between nurses and physicians. Understanding gaps between theory and practice is necessary for students' abstract conceptualization regarding the use of SBAR because parts of information conveyed during communication between nurses and physician tend to be omitted (Joffe et al., 2013). Accordingly, the instructor provided participants feedback about real cases observed in the clinical setting. Although simulation-based educational programs are effective in educational contexts, particularly as it pertains to communication, there has been limited research testing whether this communication improvement in the simulation room reflects real performances in hospitals (Kaplonyi et al., 2017).

First, the implementation of SBAR communication effects an increase of SBAR communication. In a previous study, the SBAR program with role play for nurses positively influenced SBAR communication (Chaharsoughi et al., 2014). All four categories' scores significantly increased following participation in the program, with particularly higher improvements occurring in the Background domain. This is noteworthy because nurses often omit information or report wrong information regarding the background cue (Joffe et al., 2013). There was a small change in the Situation domain, suggesting that nursing students did not recognize the aggravating situation of the patients

(Bogossian et al., 2014). The total score of 17.65 at posttest following the implementation of the program was higher than that of 17.29 in a previous study with SBAR role play using simulation, and there were significant changes in scores for the Situation, Background, and Recommendation domains, but not the Assessment domain (Yu and Kang, 2017). In particular, the improvement of the Recommendation domain following the program is noteworthy, because Recommendation accuracy is low among nurses (Spooner et al., 2016).

Second, the program increased students' perception on communication clarity. This result is similar with that of a study that conducted an SBAR education program involving role play and simulator-enhanced communication clarity (Yu and Kang, 2017). The program was not effective in terms of the "Emphasis on an emergency patients' problem" item, a result that resembles the finding of a previous study (Yu and Kang, 2017). Therefore, nursing faculties should educate students to recognize and respond to clinical deterioration (Bucknall et al., 2016).

Third, the program enhanced nursing students' handover confidence. Findings of previous studies were mixed. Thomas et al. (2009) reported that simulation-based education had a positive impact on handover confidence, while Yu and Kang (2017) reported that there was no significant improvement. This is possibly because our program provided various scenarios and repeated feedback to nursing students who have been adequately exposed to SBAR cases.

Fourth, the program was not effective in increasing practicum satisfaction. The posttest means of 7.92 in the experimental group and 7.46 in the control group were higher than those of 7.42 in the experimental group and 5.35 in the control group in a previous study (Yu and Kang, 2017), but there was no significant difference between the two groups in this study. Practicum satisfaction has relationships with various factors, such as stress and depression (Jeong and Park, 2013), curriculum, grades, and satisfaction on nursing major (Kim et al., 2013). To enhance students' practicum satisfaction, efforts to decrease psychological distress related to the practicum, as well as improvements of educational factors by school faculty members, may be necessary.

Fifth, this program was not effective in increasing clinical practice self-efficacy. Simulation education's effects on self-efficacy depend on

study design; the simulation had a positive impact on self-efficacy in pretest-posttest designs, but self-efficacy in the simulation group did not appear higher than under other teaching methods in experimental studies (Cant and Cooper, 2017). In another study, self-efficacy increased in a dedicated education unit that provided individual mentorship (George et al., 2017). Notably, these findings suggest that strong environmental support pertaining to the clinical practicum and repeated education should be provided to increase the self-efficacy of the nursing students.

Sixth, we observed no change in the perceived collaborations between nurses and physicians between the two groups. This finding is contrary to a previous study reporting that SBAR simulation education for pharmacy students increased favorable attitudes regarding the interprofessional collaboration and self-concept of interprofessional competence (Kostoff et al., 2016). A two-hour lecture on communication skills and the importance of collaboration increased favorable attitudes toward collaboration and communication among nurses (McCaffrey et al., 2012). Experiences of inadequate communication could lead to inadequate learning for students in the real world (Jarvelainen et al., 2018). To enhance perceived collaborations between nurses and physicians, further modifications of this program will be needed for nursing students.

In summary, the SBAR program improves communication skill acquisition of nursing students and there were no improvements in general perception related to practica. These findings present comparable outcomes with other SBAR communication programs using simulators. The SBAR communication program linked to a clinical practicum, without the use of a simulator, could be a cost-effective strategy; this is particularly true for a nursing curriculum that only allows a relatively low number of hours for simulation courses.

#### 4.1. Limitations of the study

First, this study has limited generalizability, as it was a single-institution study. Second, the instruments used to evaluate the practice-related outcome variables did not influence the difference in perceptions between the two groups, because the program was conducted within a relatively short period.

## 5. Conclusions

We developed an SBAR communication program based on experiential learning theory in a pediatric nursing practicum. The SBAR communication program improves senior nursing students' communication skill acquisition and handover confidence by effectively integrating the situations they face into scenarios and by observing situations in the real clinical setting. It is uncertain whether the program improved nursing students' other perceptions related to the practicum. Multi-institutional studies and applications in other nursing practica are needed to evaluate the impact of the SBAR communication program on nursing students' communication skills and perception outcomes.

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## Ethical approval

This study was performed after institutional review board approval (IRB No. DHUMC-D-18004 January 20/2018) in Daegu Oriental Hospital of Daegu Haany University.

## Declaration of Competing Interest

There were no known conflicts of interest associated with this

publication.

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