

Korean nurses' perception and performance on communication with physicians in clinical deterioration

Bo-Gyeong Jin, MSN, RN^a, Kyoungrim Kang, PhD, RN^{b,*} , Hyun-Jin Cho, MSN, RN^c

Abstract

Effective communication between nurses and physicians is necessary for prompt and accurate responses in clinical deterioration. This study aimed to examine nurses' perception and performance of communication with physicians in clinical deterioration situations in the ward. A descriptive research design with a survey of 250 ward nurses working in 2 tertiary hospitals was used. Regarding communication with the physician, nurses' perception was highest for timeliness, followed by accuracy, understanding, satisfaction, and openness, and their performance was highest for preparation, followed by situation, background, assessment, and recommendation. It is suggested that proactive activities for improving openness, accuracy, satisfaction, and mutual understanding between physicians and nurses are required for patient safety. Additionally, the performance for assessment and recommendations should be improved. Education programs for nurses and physicians should be developed and applied to clinical practice to promote understanding and trust in interprofessional communication.

Abbreviations: ICU = Intensive Care Unit, SBAR = Situation, Background, Assessment, Recommendation.

Keywords: clinical deterioration, communication, hospital units, nurses, perception, performance, physicians

1. Introduction

Today's healthcare setting is becoming increasingly complex and diverse due to an increase in older patients with complex health concerns amid advances in state-of-the-art medical technologies and, consequently, increased life expectancy.^[1] As intensive care units (ICUs) have limited capacities, patients with diverse conditions and high dependence are gradually being admitted more to general patient wards.^[2] As a result, clinical deterioration, such as sudden changes in a patient's state, also occurs in general wards,^[3] and is a significant cause of death among inpatients.^[4]

The odds for sustaining a potentially avoidable cardiac arrest in the hospital are 5.1 times higher among patients in the general ward than among those in the ICU.^[5] However, since continuous monitoring of patients is more burdensome in general wards than in ICUs or emergency departments, deterioration detection is often delayed, and consequent failure to provide timely treatment occasionally leads to life-threatening situations, such as cardiac arrest.^[6] Ward nurses' prompt and appropriate responses to clinical deteriorations are essential to ensure patient safety.^[7]

Nurses and physicians are essential personnel in patient care, and effective communication among them is crucial for patients' lives and safety.^[8] Communication problems occur in various healthcare environments; however, communication is significantly more highlighted during clinical deterioration.^[9] In such situations, nurses and physicians must communicate effectively, express their thoughts without hesitance, deliver accurate information on time, and understand each other's goals and plans.^[10] However, despite the importance of communication between nurses and physicians in clinical settings, some nurses tend to be reluctant to notify physicians even after changes in patients' states due to negative communication experiences in the past.^[11] In clinical practice, communication is frequently delayed, or miscommunication occurs because physicians ignore or fail to respond to nurses' reports of their concerns or subtle changes in a patient's status.^[12]

A 2004 report by the Joint Commission International shows that 72% of sentinel events were caused by a communication error.^[13] Ineffective communication between nurses and physicians may lead to ICU admission, severe sequelae, cardiac arrest, or even death.^[9] Thus, it is vital to promote

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Informed consent was obtained from the participants.

All data generated or analyzed during this study are included in this published article [and its supplementary information files]. The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

This study was approved by the Institutional Review Board of Pusan National University (PNU IRB/2020_114_HR).

^a College of Nursing, Pusan National University, Yangsan, Korea, ^b College of Nursing, Research Institute of Nursing Science, Pusan National University, Yangsan, Korea, ^c College of Nursing, Pusan National University, Yangsan, Korea.

*Correspondence: Kyoungrim Kang, College of Nursing, Research Institute of Nursing Science, Pusan National University, 49 Busandaehak-ro,

Mulgeum-eup, Yangsan-si, Gyeongsangnam-do 50612, Korea (e-mail: krkang@pusan.ac.kr).

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effective communication between nurses and physicians in clinical deterioration.

The United States Institute for Healthcare Improvement recommended the use of the situation, background, assessment, recommendation (SBAR) technique to ensure interdisciplinary collaboration, and effective communication within teams in healthcare organizations.^[14] SBAR is a standardized technique for communication that begins with the delivery preparation of essential patient-related information to a physician.^[15] This technique enables individuals to deliver crucial information about a patient's state requiring immediate action or attention concisely, and it is a straightforward technique particularly helpful in situations of rapid deterioration of a patient's state.^[16] During clinical deterioration, the last step of the SBAR report technique enables the nurse to make recommendations about the gravity of the situation, which is then communicated to the physician, who is able to immediately make clinical judgements on the basis of this information^[17] Hence, examining how ward nurses communicate with physicians in clinical deterioration is essential.

In Korea, the existing literature on perceived communication between physicians and nurses was primarily focused on communication between the 2 groups in ordinary situations.^[18–21] In countries other than Korea, most studies were conducted on ICU nurses^[22–24] and ED nurses.^[25]

Therefore, this study aims to examine nurses' perceived communication and communication practices with physicians in clinical deterioration in general wards, ultimately presenting evidence for promoting effective communication in clinical settings.

2. Methods

2.1. Aims

1. Examine participants' general and communication-related characteristics.
2. Investigate participants' perceptions and communication practice with physicians in clinical deterioration.
3. Identify the differences in participants' perceptions and communication practices with physicians in clinical deterioration according to their general and communication-related characteristics.

2.2. Study design

This descriptive survey research aimed to examine ward nurses' perceptions and communication practices with physicians in clinical deterioration.

2.3. Participants

General ward nurses of one tertiary hospital in cities A and B were recruited. The inclusion criteria were nurses who provided direct adult care, engaged in communication with physicians, and provided an informed consent form to participate in this study. The exclusion criteria were nurses working in a ward for patients with physiological differences from general, nurses with a clinical experience of 6 months or less who have difficulty providing patient care independently, nurse managers who do not provide direct patient care, and very important person ward nurses whose decision to participate in this study may be influenced by the authors of this study working in the same ward.

The sample size was calculated following a previous study investigating nurses' perceived communication among healthcare providers in secondary hospitals^[21] using G*Power 3.1.9 software. The minimum sample size was calculated to be 222 and considering a 10% dropout, 250 was set as the target sample size. A total of 250 participants (247 online and 3 offline) were

recruited. After excluding 4 participants with a clinical experience of fewer than 6 months and 17 who submitted incomplete questionnaires, a total of 229 participants were included in the final analysis.

2.4. Instruments

A self-reported questionnaire containing items about general and communication-related characteristics, perceived communication between nurses and physicians, and nurses' communication practices with physicians in clinical deterioration was used.

2.4.1. General and communication-related characteristics. Items for general characteristics and communication-related characteristics for communication between healthcare providers were selected by reviewing the existing literature. Six items for general characteristics were used: sex, age, highest education, current work unit, duration of employment in the current unit, and central roles and responsibilities. Communication-related characteristics included time from the clinical deterioration detection to reporting to a physician, the position of the physician initially contacted, method of initial contact, prior education about communication, and type of communication (multiple responses allowed). Finally, one open-ended question, "Please describe a situation, if any, wherein you were hesitant to contact a physician when you noticed a patient's state deteriorating during your shift," was used to survey reasons why nurses were hesitant to contact a physician about patient deterioration.

2.4.2. Perception of communication between nurses and physicians. From the ICU Nurse-Physician Questionnaire developed by Shortell et al^[10] and translated into Korean by Cho et al,^[18] statements about nurse-physician communication were used. The original scale was developed for ICU use but validated for use in various healthcare organizations.

Nineteen items for 5 domains were used, including 4 items for openness, 3 for accuracy, 8 for interdisciplinary understanding, 3 for timeliness, and one for overall satisfaction. Each item is rated on a 5-point Likert scale, ranging from 1 "strongly disagree" to 5 "strongly agree." A higher score indicates perceiving communication more positively. Items 2, 4, and 7 were negatively worded, so these items were reverse scored. The Cronbach's α for each domain ranged from .64 to .88 at the development time. The Cronbach's α for the Korean scale translated by Cho et al^[18] was .89 and that in this study was .90.

2.4.3. Nurses' communication practice with the physician in clinical deterioration. To measure nurses' communication practice with physicians in clinical deterioration, we reviewed relevant studies and literature^[17,26–28] and developed 30 preliminary items based on the guidelines for communication with physicians using the SBAR process developed by the Institute for Healthcare Improvement.^[14] The preliminary items were developed specifically for the preparation stage, during which nurses prepare to contact a physician by structuring their communication about clinical deterioration and the SBAR process during communication. Content validity was evaluated by 6 experts. In the first round of expert validity testing, 24 of 30 items had a content validity index of 0.80 or higher,^[29] and the 6 remaining items with 0.40 to 0.60 were modified to develop the second draft of the items, including 30 items, with 6 items for preparation before contacting a physician, 7 for situation, 8 for background, 4 for assessment, and 5 for recommendation. The second draft of items was evaluated by one expert, and the scale was finalized to 30 items based on the results. For each item, nurses specify the degree to which they actually applied or performed the described task while communicating with a physician during clinical deterioration using a 5-point Likert scale consisting of 1 "rarely," 2 "occasionally," 3 "quite often,"

4 “frequently,” and 5 “always.” A higher score indicates a better communication practice. The Cronbach’s α of the scale was 0.87, and each domain included 0.68 for preparation, 0.53 for the situation, 0.78 for background, 0.58 for assessment, and 0.84 for the recommendation.

2.5. Data collection

This study was approved by the Institutional Review Board of the authors’ affiliation. Data were collected from December 2020 to April 2021. After explaining the study purpose and method to the nursing department at the study organizations and obtaining permissions, volunteers were recruited by posting a recruitment announcement specifying the purpose, method, and eligibility criteria on the bulletin board in the hospitals’ groupware. Data were collected through online and written questionnaires. Participants could access the online questionnaire through a uniform resource locator or quick response code shown on the recruitment announcement, and the first page of the questionnaire explained the purpose of the study, method of response, compensation for participation, and confidentiality, along with a consent page. Only those who checked the box to indicate consent were given to proceed with the questionnaire. Data collected online were managed privately and stored in a password-protected file to ensure that only the authors had data access. Participants who wished to participate in the written questionnaire completed the questionnaire in a private and easily accessible space, such as a seminar room or consultation room, at each ward after obtaining permission from the corresponding unit. All processes were performed in compliance with the coronavirus disease 2019 prevention guidelines. For example, a hand sanitizer was placed at the entrance so that the participants could sanitize their hands before entering the room to complete the questionnaire. The author visited the facility to distribute the information sheet, consent form, and questionnaire and completed consent forms and questionnaires were sealed in an opaque envelope and retrieved by the author. It took approximately 15 minutes to complete the questionnaire, which was administered only once. All online participants were given a mobile gift icon (mobile gift card), and in-person participants were given a nail clipper set as a token of appreciation.

2.6. Data analysis

The collected data were analyzed using Statistical Package for the Social Sciences Window 26.0 software (SPSS, Inc., Chicago, IL), and the following statistical techniques were used:

1. Participants’ general and communication-related characteristics were analyzed with frequency, percentage, or mean with standard deviation.
2. Participants’ perception and communication practice were analyzed with the mean and standard deviation.
3. Differences in perception and communication practice according to general and communication-related characteristics were analyzed with *t*-test and analysis of variance, followed by the Scheffé test for parameters with significant differences.

There were no outliers, thus all data collected were included in the data analyses.

3. Findings

3.1. Participants’ general and communication-related characteristics

Table 1 shows the participants’ general and communication-related characteristics. Most (98.3%) participants were female,

and the mean age was 27.76 ± 3.16 years. The highest education was a bachelor’s degree in 88.2% of the participants. The current work unit was internal medicine (45.4%) or surgery (54.6%), and the mean length of career at the current unit was 3.50 ± 2.57 years. The central roles and responsibilities were medication administration and primary care before and after tests, procedures, and surgeries (63.8%).

Most (57.2%) participants had no prior communication-related education. Of those with prior education, the most common type of communication was SBAR communication (38.4%), followed by nonviolent conversation (31.1%), and self-assertive communication (30.5%). The mean time from detecting clinical deterioration to reporting to a physician was 4.59 ± 3.53 minutes. The position of the physician initially contacted was a resident (90.4%), and the most common method of communication was a telephone for weekdays and weekends or holidays.

A total of 161 participants answered the open-ended question about their experiences of being hesitant to contact a physician after detecting clinical deterioration. A total of 210 statements were broadly divided into 3 categories, including physicians’ attitudes, nurses’ attitudes, and time or situational factors. The most commonly mentioned factor was the physician’s annoyed response (30.0%). Other factors included physicians’ or nurses’ negative attitudes and time/situational factors. The physicians’ negative attitudes were physician’s angry or annoyed response, not giving an appropriate prescription or feedback, different view of patient’s clinical deterioration from that of physician’s, and difficulty reaching physician via phone. The nurses’ negative attitudes were difficulty determining the change in patient’s state, or deterioration not based on objective criteria, and lack of confidence. The time/situational factors were difficulty verbally explaining patient’s deterioration, having to contact an on-call physician than attending physician outside regular hours, having to contact a physician late at night or early in the morning, immediately after contacting the physician or after frequently contacting the physician, when the physician is in surgery, when the physician’s shift changes, and during an in-hospital cardiopulmonary resuscitation situation.

3.2. Participants’ perception and communication practice

Table 2 shows the participants’ perception and communication practice. The mean perceived communication score was 2.88 ± 0.51 of 5. By domain, the score was the highest for timeliness (3.58 ± 0.60), followed by accuracy (2.80 ± 0.59), interdisciplinary understanding (2.79 ± 0.59), satisfaction (2.74 ± 0.92), and openness (2.64 ± 0.79).

The mean communication practice score was 3.78 ± 0.45 of 5. By domain, the score was the highest for preparation (4.30 ± 0.53), followed by the situation (4.15 ± 0.45), background (3.76 ± 0.64), assessment (3.21 ± 0.65), and recommendation (3.11 ± 0.87).

3.3. Differences in perceived communication with a physician according to participants’ general and communication-related characteristics.

Table 3 shows the differences in perceived communication according to participants’ characteristics.

Openness was more positively perceived by nurses aged 30 to 39 years than by those aged 20 to 29 years ($t = -2.52$, $P = .012$) and those with no prior education about nonviolent conversations ($t = -2.56$, $P = .011$). The post hoc test confirmed that nurses with a career duration of 7 years or longer in the current unit perceived openness more positively than nurses with a career duration of 1–3 years in the current unit ($F = 2.87$, $P = .037$). Accuracy was more positively

Table 1
Participants' general and communication-related characteristics (N = 229).

Characteristic	Category	n	%	Mean ± SD	
Sex	Male	4	1.7	27.76 ± 3.16	
	Female	225	98.3		
Age	20–29 yr	166	72.5	27.76 ± 3.16	
	30–39 yr	63	27.5		
Highest education	Associate degree	13	5.7	27.76 ± 3.16	
	Bachelor's degree	202	88.2		
	Master's degree or higher	14	6.1		
Current work unit	Internal medicine	104	45.4	27.76 ± 3.16	
	Surgery	125	54.6		
Length of career in the current unit (yr)	<1	30	13.1	3.50 ± 2.57	
	1–3	111	48.5		
	4–6	62	27.1		
	≥7	26	11.4		
Major roles and responsibilities	Comprehensive and coordination	83	36.2	27.76 ± 3.16	
	Medication administration and basic care	146	63.8		
Prior communication education	Yes	98	42.8	27.76 ± 3.16	
	No	131	57.2		
Type of education*	SBAR training	58	38.4	27.76 ± 3.16	
	Non-violent conversation	47	31.1		
	Self-assertive communication	46	30.5		
Experience of being hesitant to call a physician	Yes	161	70.3	27.76 ± 3.16	
	No	68	29.7		
Reason for hesitation†		210	100	27.76 ± 3.16	
Physician's attitude	Annoyed response	63	30.0		
Nurse's attitude	Lack of feedback	19	9.0	27.76 ± 3.16	
	Different view of patient's state	16	7.6		
	Blaming the nurse	10	4.8		
	Difficulty of judging deterioration	18	8.6		
Time/situation-related factors	Lack of confidence	9	4.3	27.76 ± 3.16	
	Difficulty of explaining the situation	2	1.0		
	Difficulty of reaching the physician over the phone	2	1.0		
	Contacting the on-call physician instead of the attending physician outside normal hours	29	13.8		
	Nighttime	22	10.5		
	Immediately after calling or after calling frequently	11	5.2		
Time until reporting (min)	Physician is in surgery	5	2.4	4.59 ± 3.53	
	Physician's shift change	2	1.0		
	Immediately after CPR announcement in the hospital	2	1.0		
Position of physician initially contacted	Intern	2	0.9	4.59 ± 3.53	
	Resident	207	90.4		
	Fellow	8	3.5		
	Attending	12	5.2		
Method of initial contact	Weekday (Daytime)	Phone	225	98.3	27.76 ± 3.16
		Text	3	1.3	
		Visit in person	1	0.4	
	Weekday (Nighttime)	Phone	222	96.9	
		Text	6	2.6	
		Visit in person	1	0.4	
	Off-days (Daytime)	Phone	220	96.1	
		Text	8	3.5	
		Visit in person	1	0.4	
	Off-day (Nighttime)	Phone	219	95.6	
		Text	9	3.9	
		Visit in person	1	0.4	

CPR = cardiopulmonary resuscitation, SBAR = Situation, Background, Assessment, Recommendation, SD = standard deviation.

*Multiple responses accepted.

†Multiple responses from 161 participants regarding the reason for having been hesitant in communication (open-ended).

perceived by nurses whose central roles and responsibilities were medication administration and primary care than those with comprehensive care and coordination ($t = -2.97$, $P = .003$) and those who were never hesitant to contact a physician ($t = -3.51$, $P = .001$). Interdisciplinary understanding was more positively perceived by nurses without prior education about nonviolent conversation ($t = -2.15$, $P = .033$) and those who were never hesitant to contact a physician ($t = -4.05$, $P < .001$). The post hoc test confirmed

that nurses with less than 1 year of experience in the current unit had more positive perceptions than those with 4 to 6 years in the current unit ($F = 3.86$, $P = .010$). Satisfaction was more positively perceived by nurses without prior education about nonviolent conversation ($t = -3.05$, $P = .003$) and those never hesitant to contact a physician ($t = -2.26$, $P = .025$). Timeliness was more positively perceived by nurses currently working in internal medicine than those in surgery ($t = 2.62$, $P = .009$).

Table 2
Participants' perception and communication practice (N = 229).

Category	Mean ± SD
Perception (total)	2.88 ± 0.51
Openness	2.64 ± 0.79
Accuracy	2.80 ± 0.59
Understanding	2.79 ± 0.59
Satisfaction	2.74 ± 0.92
Timeliness	3.58 ± 0.60
Practice (total)	3.78 ± 0.45
Preparation	4.30 ± 0.53
Situation	4.15 ± 0.45
Background	3.76 ± 0.64
Assessment	3.21 ± 0.65
Recommendation	3.11 ± 0.87

SD = standard deviation.

3.4. Differences in communication practice with a physician according to participants' general and communication-related characteristics

Table 4 shows the differences in the communication practice according to participants' characteristics.

There were no significant differences in the preparation stage. The practice of the situation element significantly differed according to prior SBAR education ($t = 2.59, P = .010$) and self-assertive communication education ($t = 2.73, P = .007$), wherein nurses receiving these showed a better practice of the situation element. The practice of the background element was significantly higher among nurses whose central roles and responsibilities are comprehensive care and coordination than among those with medication administration and primary care ($t = 3.12, P = .002$). It was also higher among those with prior communication education ($t = 3.58, P < .001$), SBAR education ($t = 3.15, P = .002$), and self-assertive communication education ($t = 3.29, P = .001$). The post hoc test confirmed that the practice of the background element was higher among nurses with a career of 7 years or longer in the current unit than among nurses with less than 1 year in the current unit ($F = 2.68, P = .048$). The practice of the assessment element was higher with a longer career in the current unit ($F = 4.40, P = .005$) and prior self-assertive communication education ($t = 2.01, P = .046$). The practice of the recommendation element was higher among nurses aged 30 to 39 years than among those aged 20 to 29 years ($t = -3.26, P = .001$), among nurses who currently work in surgery than among those in internal medicine ($t = -2.24, P = .026$), and among nurses whose central roles and responsibilities are comprehensive care and coordination than among those responsible for medication administration and primary care ($t = 3.14, P = .002$). Practice of the recommendation element was higher with prior communication education ($t = 3.27, P < .001$), SBAR education ($t = 4.11, P < .001$), nonviolent conversation education ($t = 2.02, P = .045$), and self-assertive communication education ($t = 2.73, P = .007$). The post hoc test confirmed that the practice of the recommendation element was higher among nurses with 7 years or longer careers in the current unit than among nurses with less than 1 year, 1–3 years, or 4–6 years of careers in the current unit ($F = 7.32, P < .001$).

4. Discussion and recommendations

This study investigated ward nurses' perception and communication practice with a physician after detecting clinical deterioration.

In this study, the mean score for perceived communication with a physician in clinical deterioration was 2.88 ± 0.51 of

5, lower than that reported by a study on nurses' perception of communication with a physician in a general situation.^[19,20] This may be because ineffective communication occurs more frequently in environments that call for quick and accurate decision-making, such as clinical deterioration.^[30] The negative perception of communication in a clinical deterioration can adversely impact a patient's safety^[31]; hence, measures to enhance nurses' perception of communication with a physician in clinical deterioration must be implemented.

Our participants perceived openness as the most lacking element in their communication with a physician (2.64 ± 0.79). This aligns with internal medicine ward nurses (2.68) and surgical ward nurses (2.75) of a secondary hospital using the same instruments^[18] but lower than that found among ward nurses in a military hospital (3.08).^[19] In other countries, the scores were 3.64 among ED nurses,^[25] 3.70,^[23] 3.90 among ICU nurses,^[24] and 3.50 among neonatal ICU nurses.^[22] Considering nurses' perception of communication with physicians, nurses tend to perceive that openness is substantially lacking in their communication. This may be attributable to the cultural features in Korea, where nurses tend to be timid when communicating with physicians and are influenced by a substantial hierarchical organizational structure.^[32] Moreover, not only in Korea, but also in other countries it might be thought that doctors' professional positions would have the social superiority.^[33] Nurses' perception of insufficient openness in communication can lead to omissions of crucial patient-related information in clinical deterioration and cause nurses to be hesitant to contact a physician, thereby further aggravating the patient's state.^[34] Therefore, organizational measures to emphasize effective communication and foster an open atmosphere wherein members can share information without hesitance are required.

The participants most positively perceived the timeliness aspect of communication with physicians (3.58 ± 0.60). This supports previous findings that timely and appropriate responses to changes in patients' states were perceived as crucial.^[24] The positive perception of timeliness, the immediate delivery of information about a patient's treatment upon changes in the patient's status,^[10] is crucial for promoting patient safety in clinical deterioration. However, this score is lower than that found among internal medicine ward nurses (3.85), surgical ward nurses (3.82),^[18] ward nurses of a military hospital (3.84),^[19] ICU nurses (3.70 and 3.75),^[23,24] neonatal ICU nurses (3.70),^[22] and ED nurses (3.79)^[25] for ordinary situations using the same instrument. Regarding past experiences of being hesitant to contact a physician, nurses explained the reasons as difficulty judging the patient's deterioration, lack of confidence, and difficulty explaining the situation. This shows that timely communication is more hindered in the ICU and ED, where emergencies occur frequently, and in clinical deterioration as in our study, than in other ordinary situations. The less positive perception of timeliness among our participants than ICU or ED nurses could be due to the delay in communication about patient status changes by general ward nurses due to the hospital environment, such as lack of equipment for 24-hour monitoring in general wards, and nurses' unfamiliarity with emergency situations.^[35] Therefore, nurses must continually engage in self-improvement activities to bolster their professional knowledge base and confidence.

Regarding communication practice in clinical deterioration, preparation before contacting a physician about clinical deterioration was the highest. Nurses must prepare before contacting a physician because being fully aware of the essential patient-related information facilitates their communication with a physician.^[17] Nurses must accurately identify a patient's state and ensure they have answers to the physician's questions based on their assessment before contacting them.^[36] Therefore, nurses should acquire professional knowledge to help them assess a patient's state upon clinical deterioration and receive communication education and training to deliver essential information concisely and accurately.

Table 3
Differences in perception of communication according to participants' characteristics (N = 229).

Characteristic	Category	Openness		Accuracy		Understanding		Satisfaction		Timeliness	
		M ± SD	t/F(P)	M ± SD	t/F(P)	M ± SD	t/F(P)	M ± SD	t/F(P)	M ± SD	t/F(P)
Age	20–29 yr	2.56 ± 0.80	-2.52 (.012)	2.80 ± 0.58	0.03 (.979)	2.79 ± 0.60	-0.04 (.968)	2.74 ± 0.93	-0.04 (.970)	3.61 ± 0.58	1.24 (.215)
	30–39 yr	2.85 ± 0.74		2.80 ± 0.60		2.79 ± 0.59		2.75 ± 0.90		3.50 ± 0.66	
Current unit	Internal medicine	2.61 ± 0.73	-0.51 (.609)	2.78 ± 0.54	-0.44 (.664)	2.81 ± 0.52	0.43 (.668)	2.82 ± 0.83	1.14 (.255)	3.69 ± 0.52	2.62 (.009)
	Surgery	2.66 ± 0.84		2.82 ± 0.62		2.77 ± 0.65		2.68 ± 0.99		3.49 ± 0.65	
Length of career in current unit (yr)	<1 ^a	2.61 ± 0.73	2.87 (.037)	3.02 ± 0.49	2.20 (.089)	3.08 ± 0.50	3.86 (.010)	3.00 ± 0.87	1.64 (.180)	3.52 ± 0.52	1.75 (.158)
	1–3 ^b	2.53 ± 0.75	b < d ^c	2.74 ± 0.55		2.75 ± 0.55	c < a ^c	2.73 ± 0.89		3.66 ± 0.58	
	4–6 ^c	2.69 ± 0.88		2.76 ± 0.67		2.66 ± 0.67		2.58 ± 1.03		3.45 ± 0.71	
	≥7 ^d	3.02 ± 0.74		2.90 ± 0.56		2.90 ± 0.58		2.88 ± 0.77		3.58 ± 0.50	
Major roles and responsibilities	Comprehensive care	2.75 ± 0.77	1.58 (.115)	2.65 ± 0.57	-2.97 (.003)	2.75 ± 0.57	-0.63 (.532)	2.72 ± 0.86	-0.24 (.810)	3.62 ± 0.55	0.77 (.445)
	and coordination Medication and basic care	2.58 ± 0.80		2.89 ± 0.58		2.81 ± 0.61		2.75 ± 0.96		3.55 ± 0.64	
Prior communication education	Yes	2.60 ± 0.82	-0.63 (.530)	2.81 ± 0.55	0.20 (.842)	2.80 ± 0.65	0.24 (.807)	2.64 ± 0.91	-1.42 (.158)	3.53 ± 0.63	-1.10 (.274)
	No	2.67 ± 0.77		2.79 ± 0.61		2.78 ± 0.56		2.82 ± 0.93		3.62 ± 0.58	
SBAR training	Yes	2.68 ± 0.86	0.44 (.664)	2.81 ± 0.56	0.15 (.884)	2.89 ± 0.64	1.60 (.112)	2.67 ± 0.98	-0.67 (.505)	3.54 ± 0.56	-0.55 (.584)
	No	2.62 ± 0.77		2.80 ± 0.60		2.75 ± 0.57		2.77 ± 0.90		3.59 ± 0.62	
Non-violent conversation	Yes	2.38 ± 0.83	-2.56 (.011)	2.78 ± 0.53	-0.27 (.789)	2.62 ± 0.61	-2.15 (.033)	2.38 ± 0.85	-3.05 (.003)	3.48 ± 0.70	-1.22 (.225)
	No	2.70 ± 0.77		2.81 ± 0.60		2.83 ± 0.59		2.84 ± 0.92		3.60 ± 0.58	
Self-assertive communication	Yes	2.68 ± 0.91	0.45 (.652)	2.83 ± 0.59	0.33 (.742)	2.90 ± 0.63	1.47 (.142)	2.52 ± 1.01	-1.82 (.069)	3.70 ± 0.54	1.57 (.117)
	No	2.63 ± 0.76		2.79 ± 0.59		2.76 ± 0.58		2.80 ± 0.89		3.55 ± 0.62	
Hesitant to communicate	Yes	2.58 ± 0.79	-1.72 (.086)	2.71 ± 0.60	-3.51 (.001)	2.69 ± 0.58	-4.05 (<.001)	2.66 ± 0.95	-2.26 (.025)	3.56 ± 0.65	-0.63 (.528)
	No	2.78 ± 0.78		3.00 ± 0.51		3.02 ± 0.57		2.94 ± 0.83		3.61 ± 0.49	

M ± SD = mean ± standard deviation, SBAR = Situation, Background, Assessment, Recommendation.
The significance level at P < .05.
^aScheffé test.

Table 4
Differences in communication practice according to participants' characteristics (N = 229).

Characteristic	Category	Preparation		Situation		Background		Assessment		Recommendation	
		M ± SD	t/F(P)	M ± SD	t/F(P)	M ± SD	t/F(P)	M ± SD	t/F(P)	M ± SD	t/F(P)
Age	20–29 yr	4.31 ± 0.53	0.36 (.722)	4.13 ± 0.43	-0.88 (.380)	3.71 ± 0.63	-1.78 (.076)	3.19 ± 0.63	-0.74 (.461)	2.99 ± 0.83	-3.26 (.001)
	30–39 yr	4.28 ± 0.53		4.19 ± 0.49		3.88 ± 0.65		3.26 ± 0.70		3.40 ± 0.89	
Current unit	Internal medicine	4.34 ± 0.55	1.11 (.268)	4.15 ± 0.43	0.03 (.975)	3.76 ± 0.67	0.02 (.983)	3.14 ± 0.58	-1.58 (.115)	2.97 ± 0.90	-2.24 (.026)
	Surgery	4.27 ± 0.51		4.15 ± 0.47		3.76 ± 0.61		3.27 ± 0.69		3.22 ± 0.82	
Length of career in current unit (yr)	<1 ^a	4.08 ± 0.52	2.49 (.061)	4.24 ± 0.43	1.14 (.333)	3.61 ± 0.54	2.68 (.048)	3.18 ± 0.73	4.40 (.005)	2.78 ± 0.97	7.32 (<.001)
	1–3 ^b	4.32 ± 0.53		4.09 ± 0.47		3.70 ± 0.68	a < d ^c	3.07 ± 0.59		3.04 ± 0.87	a,b,c < d ^c
	4–6 ^c	4.40 ± 0.49		4.19 ± 0.39		3.83 ± 0.58		3.37 ± 0.59		3.11 ± 0.78	
Major roles and responsibilities	≥7 ^d	4.26 ± 0.57		4.15 ± 0.47		4.02 ± 0.62		3.45 ± 0.75		3.77 ± 0.58	
	Comprehensive care and coordination	4.36 ± 0.52	1.19 (.236)	4.18 ± 0.40	0.93 (.353)	3.93 ± 0.59	3.12 (.002)	3.30 ± 0.53	1.62 (.107)	3.34 ± 0.80	3.14 (.002)
	Medication and basic care	4.27 ± 0.53		4.13 ± 0.47		3.66 ± 0.64		3.16 ± 0.70		2.97 ± 0.87	
Prior communication education	Yes	4.36 ± 0.48	1.57 (.118)	4.20 ± 0.43	1.71 (.089)	3.93 ± 0.65	3.58 (<.001)	3.29 ± 0.68	1.68 (.094)	3.32 ± 0.85	3.27 (<.001)
	No	4.25 ± 0.56		4.10 ± 0.46		3.63 ± 0.60		3.15 ± 0.62		2.95 ± 0.85	
SBAR training	Yes	4.32 ± 0.48	0.40 (.687)	4.28 ± 0.42	2.59 (.010)	3.98 ± 0.59	3.15 (.002)	3.33 ± 0.61	1.60 (.111)	3.50 ± 0.84	4.11 (<.001)
	No	4.29 ± 0.54		4.10 ± 0.45		3.68 ± 0.64		3.17 ± 0.65		2.97 ± 0.83	
Non-violent conversation	Yes	4.38 ± 0.45	1.35 (.181)	4.25 ± 0.40	1.78 (.076)	3.89 ± 0.61	1.62 (.106)	3.34 ± 0.75	1.55 (.123)	3.33 ± 0.86	2.02 (.045)
	No	4.28 ± 0.54		4.12 ± 0.46		3.73 ± 0.64		3.18 ± 0.61		3.05 ± 0.86	
Self-assertive communication	Yes	4.42 ± 0.46	1.79 (.076)	4.30 ± 0.43	2.73 (.007)	4.03 ± 0.68	3.29 (.001)	3.38 ± 0.73	2.01 (.046)	3.41 ± 0.93	2.73 (.007)
	No	4.27 ± 0.54		4.11 ± 0.44		3.69 ± 0.61		3.17 ± 0.62		3.03 ± 0.83	
Hesitant to communicate	Yes	4.32 ± 0.54	0.67 (.504)	4.14 ± 0.41	-0.10 (.917)	3.81 ± 0.61	1.87 (.063)	3.22 ± 0.61	0.41 (.683)	3.07 ± 0.85	-1.03 (.304)
	No	4.26 ± 0.49		4.15 ± 0.53		3.64 ± 0.68		3.18 ± 0.72		3.20 ± 0.91	

M ± SD = mean ± standard deviation, SBAR = Situation, Background, Assessment, Recommendation.

The significance level at P < .05.

^aScheffé test.

In our study, the element of SBAR least practiced during communications with physicians in clinical deterioration was the recommendation, with the highest practice of situation, followed by background and assessment. A study that investigated the effects of SBAR reporting on a collaborative relationship with physicians among ward nurses in a tertiary hospital also showed that nurses felt awkward and uncomfortable presenting recommendations to a physician and were hesitant.^[27] Narayan^[15] also reported that nurses find it challenging to present opinions about the following steps to a physician despite knowing what went wrong and the best solution. After detecting clinical deterioration, presenting a precise suggestion of what is required could help physicians give immediate and most suitable orders.^[17] Thus, critical thinking education should be implemented for nurses, so they are more confident in recommending the best measures for patients. Specifically, since nurses are considered the key personnel in patients' treatments and who know the patient's overall condition best, regular meetings should be introduced, including both nurses and doctors for cooperative communication and for the perception that health professionals are in the horizontal structure rather than vertical.^[33]

In our analysis of the differences in the perception of communication with physicians in clinical deterioration according to the participants' general characteristics, openness was more positively perceived among older and more seasoned nurses with prolonged careers in the current unit. This aligns with a study on military hospital nurses by Choi et al,^[19] where nurses aged 35 years and over perceived openness more positively than those aged 20 to 23 years. Older nurses have more communication experience and interactions with physicians than their younger counterparts, which may be why they can communicate with physicians more openly.^[19] In contrast, interdisciplinary understanding was more positively perceived with decreasing career length in the current unit. Cho et al^[18] also reported in their study of all nurses in a secondary hospital that nurses with less than one year of career perceive interdisciplinary understanding more positively than other nurses. This may be attributable to the accumulation of negative experiences of communication with a physician over the course of one's career.^[37] Therefore, measures that help build an understanding and trust between nurses and physicians and promote mutually respectful inter-professional relationships are needed. Furthermore, to retain experienced nurses, hospitals must devise strategies to offer frequent opportunities for communication between nurses and physicians to prevent the accumulation of negative communication experiences.

In our study, nurses who were hesitant to contact a physician about changes in a patient's state had negative perceptions of accuracy, interdisciplinary understanding, and overall satisfaction with their communication with a physician. Such perceptions lead to severed communication and may hinder the accurate exchange of information between them. The most frequently mentioned reasons for being hesitant to communicate were physician's annoyed response, lack of feedback, the difference in the views of a patient's state, and blaming the nurse. In a qualitative study on long-term care hospital nurses,^[38] nurses also mentioned physicians' being annoyed by nurses' calls or hurrying to end the calls and their rude attitudes as barriers to communication. One crucial contributor to this phenomenon may be the different communication training given for nurses and physicians, where nurses often take a descriptive approach to explain the clinical situation in detail.^[13] Thus, programs that improve nurses' accurate judgment and communication skills upon encountering clinical deterioration and standardized communication training should be developed and implemented. Moreover, follow-up studies are needed to examine nurses' perceived barriers to communication with physicians in clinical deterioration.

Regarding the differences in the communication practice with a physician in clinical deterioration according to nurses'

general and communication-related characteristics, the practice of background, assessment, and the recommendation elements increased with the increasing length of career in the current unit. A study investigating nurses' inappropriate responses to clinical deterioration^[39] reported that nurses develop stronger perceptions and engage in prompt responses to situations based on prior experiences as they accumulate more experience, supporting our findings. The assessment and recommendation elements require interpreting patients' information, and presenting opinions based on a nursing assessment, and experience is critical.^[40] Newly graduated nurses lack experience in communicating with physicians and thus are more afraid of such communication.^[41] Therefore, these nurses should be given an opportunity to practice identifying patient deterioration and communicating with physicians through simulation training programs for clinical deterioration. Moreover, undergraduate nursing students should be given education to improve confidence and critical thinking skills to communicate in clinical settings effectively.

Participants with prior communication education showed a high level of practice of background and recommendation elements of SBAR. A study on staff nurses of secondary hospitals reported that nurses with prior communication education exhibited better communication skills and effectively utilized formal communication than those without prior communication training.^[42] In the present study, those with prior SBAR training showed high levels of practice of situation, background, and recommendation elements. Although we could not compare our results with the literature due to a discrepancy in the study population and instruments, studies on ED and ICU nurses^[43] and general ward nurses^[44] found that SBAR communication training was effective in enhancing communication in carrying out their roles and responsibilities. While nurses with prior communication training showed better communication practice, 57.2% of our participants had no prior communication training. As adhering to all elements of SBAR in clinical deterioration requiring prompt intervention could be virtually impossible, practical communication education programs that help nurses systematically structure a massive amount of information to deliver the essence efficiently. Hence, actively utilizing communication training programs utilizing clinical deterioration scenarios would improve nurses' communication practices.

This study has the following limitations. The Cronbach's α for the entire communication scale was high, but that for specific situations and assessment elements was low. The low reliability indicates that despite developing the items based on communication guidelines in consideration of clinical deterioration situations, the items of the instrument do not fully reflect them. Thus, the instrument should be modified to better reflect clinical deterioration scenarios, and the comprehensive care and comprehensibility of the items should be tested on experts and targeted groups. Moreover, the participants answered the questions based on their memory of previous clinical deterioration experiences; hence, the possibility of a recall bias cannot be eliminated. Subsequent studies should investigate perception and communication practice with a physician immediately after experiencing clinical deterioration to reduce recall bias. Finally, as we examined the nurses' perception of communication in clinical practice, excluding physicians', there might be a grey area for clear conclusions. Further studies on both nurses' and physicians' perceptions of communication should be conducted.

Nevertheless, this study is significant in shedding light on the current reality of ward nurses' communication with physicians upon detecting clinical deterioration, in contrast to previous studies that were primarily focused on routine situations in the healthcare setting. Since we identified the more vulnerable domains of communication using an instrument addressing nurses and physicians separately, our findings will be helpful as foundational data for developing specific improvement measures.

Regarding communication practice, nurses showed relatively high compliance with the preparation, situation, and background elements of SBAR but low compliance with the assessment and recommendation elements. Thus, organizations should strive to cultivate an open atmosphere wherein individuals can express their opinions without hesitance to enhance nurses' perception and communication practice with physicians in clinical deterioration. Moreover, practical and specific communication training programs involving both nurses and physicians should be developed to bolster mutual trust and understanding between healthcare professionals.

5. Conclusion

This study aimed to investigate ward nurses' perception and communication practice with physicians in clinical deterioration to present evidence for promoting effective communication in clinical settings to ensure patient safety.

The results of this study showed that ward nurses positively perceived the timeliness aspect of communication with the physician in clinical deterioration but negatively perceived openness, accuracy, interdisciplinary understanding, and satisfaction

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Author contributions

Conceptualization: Bo-Gyeong Jin, Kyoungrim Kang.
 Data curation: Bo-Gyeong Jin, Kyoungrim Kang, Hyun-Jin Cho.
 Formal analysis: Bo-Gyeong Jin, Kyoungrim Kang.
 Investigation: Bo-Gyeong Jin, Kyoungrim Kang.
 Methodology: Bo-Gyeong Jin, Kyoungrim Kang.
 Project administration: Bo-Gyeong Jin, Kyoungrim Kang.
 Resources: Bo-Gyeong Jin, Kyoungrim Kang.
 Software: Bo-Gyeong Jin, Kyoungrim Kang.
 Supervision: Kyoungrim Kang.
 Validation: Bo-Gyeong Jin, Kyoungrim Kang, Hyun-Jin Cho.
 Visualization: Bo-Gyeong Jin, Kyoungrim Kang, Hyun-Jin Cho.
 Writing – original draft: Bo-Gyeong Jin, Kyoungrim Kang, Hyun-Jin Cho.
 Writing – review & editing: Bo-Gyeong Jin, Kyoungrim Kang, Hyun-Jin Cho.

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