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Status and Needs of Continuing Education for Trauma Nursing

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Purpose: This study was conducted to status and needs for continuing education for trauma hospital nurses in Korea.

Methods: Thirty nurses from the seven level I trauma center hospitals or trauma treatment systems were randomly selected and surveyed. The survey was conducted from March 1 to May 31, 2017. Categorical data were analyzed with Pearson chi-square tests and Continuous variables were analyzed with ANOVA.

Results: Only 86 out of 204 nurses had received continuing education (42.1%). The current status of continuing education programs, delivering institution (p<0.001), education method (p<0.001), education period (p=0.003), number of participants (p=0.007), and instructors (p=0.014) were also significantly different from trauma center to trauma center. There were 108 (52.9%) nurses who responded that continuing education programs were "needed" 92 (45.1%) and "very much needed 16 (7.8%). According to each trauma center's characteristics were significantly differences in the need for continuing education (p=0.089), subject selection method (p<0.001) and the number of continuing education sessions (p=0.043) depending on the hospital.

Conclusions: It is necessary to consider differences between the hospitals to develop continuing education programs that reflect the needs of nurses, in order to improve the efficiency of and satisfaction with the educational programs.

Keywords: Trauma centers; Education, Continuing; Education

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INTRODUCTION

With accelerating economic growth and societal and technological development, the burden of severe trauma patients is increasing [1]. Severe trauma patients are those with external injuries, such as blunt trauma or penetrating injuries, leading to major organ damage, including in the brain, lungs, heart, or liver, which may lead to or re-

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sult from severe complications, such as shock or multiple organ dysfunction syndrome. Severe trauma patients have an injury severity score (ISS) of 15 points or higher [2].

Based on case studies from foreign countries, and working toward reducing avoidable trauma-related mortality [3], Korea began to designate regional trauma centers in 2009 for specialized treatment of severe trauma patients. Ten centers have been designated to date, with plans of increasing this number to 17 professional trauma centers [2], spearheading care for trauma patients. As the trauma centers began operations, the recruitment of both trauma specialists and trauma nursing staff began to ramp up.

Severe trauma patients are hemodynamically unstable and tend to have multiple complications, and as such require prompt and skilled care [4]. When recruiting and supporting skilled nursing personnel, clinical experience is important, along with continuous and comprehensive education to maintain and improve the knowledge and skills of nurses. One of the most critical aspects of education for nurses is continuing education [5]. Continuing education refers to a type of lifelong education that seeks to supplement, modify, and support core knowledge and skill sets required for professional conduct; it is associated with comprehensive curricula containing the latest theories and information [6]. Beginning with short-term continuing education programs in 1974, these programs are currently carried out at least once a year in Korea, for more than 8 hours a year (revision to the enforcement decree of the medical service act; October 21, 2000), under article 28, section two of the medical service act [7].

Presently, Korean trauma centers are located in metropolitan areas or provincial regions outside of Seoul, and they play a pivotal role in caring for trauma patients' needs in each region, while the patient transport system, equipment, personnel recruitment, and infrastructure continue to expand and develop. As such, the trauma centers bear a great amount of responsibility. Nurses occupy the largest proportion of trauma center human resources [8], which underscores the importance of nursing education despite it sometimes being overlooked.

The purpose of the present study was to investigate the present state and need for continuing education for nurses working in trauma center or trauma care systems, in order to develop and effectively operate continuing education programs that improve the quality of care provided in the clinical setting. The specific research objectives were as follows:

1) Identify the general characteristics of the subjects.

2) Identify the perceived state of, and satisfaction with, the continuing education programs at each hospital among those who have completed the trauma nursing continuing education programs.

3) Identify the need of trauma nursing continuing education program.

4) Compare and analyze the needs of the subjects at each hospital.

METHODS

Study design

This was a descriptive survey that aimed to identify the present state and needs of the continuing education program for nurses in tertiary hospitals with trauma centers or trauma care systems.

Study subjects

The subject to the study were nurses at seven hospitals that operate trauma center or trauma systems in Korea. Korean trauma center has facilities, equipment, and manpower that can provide optimal treatment such as emergency resuscitation, emergency surgery and treatment for patients with severe trauma or bleeding due to traffic accidents or falls. In addition, it provides rapid and intensive care for 24-hour severe trauma patients.

The subjects of this study were nurses with at least 1 year of clinical experience caring for trauma patients, which is a requirement for enrollment in the continuing education program for nurses. Thirty nurses were randomly sampled from each hospital, totaling 210 nurses. Information sheets explaining the purpose and the method of the study, as well as how the subjects could withdraw their participation at any time throughout the study were distributed to 240 subjects by mail. Nurses who refused to participate in the study were excluded from participating. Out of 240 surveys distributed, 204 were analyzed.

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Study tools

1) Continuing education - present state and satisfaction

The questionnaire on the state of and satisfaction with the continuing education program was based on the tool for nurses developed by Cheon [9], which was amended and revised by the researcher with advice from a group of the five experts had more than 10 years of combined trauma nursing experience. The expert panel for verifying the validity the survey content consisted of three professional nurses, two head intensive care unit (ICU) nurses. The validity of each questionnaire item was ensured by asking the expert panel to rate each using a four-point scale ranging from 'very valid' (four points) to 'not valid at all' (one point). We calculated the content validity index (CVI) of each questionnaire item and selected 13 of 15 items were selected.

The questionnaire items queried the number of times that the subjects received continuing education, the types of continuing education, the delivering institutions, and aspects about the instructors and education methods, satisfaction with the operations of the continuing education programs, and the extent to which the program helped with work.

The satisfaction associated with the quality and delivery of continuing education was measured on a 5-point Likert scale ranging from 'very good' (five points) to 'very poor' (one point) on the six items relating to instructors, number of participants, timing, location, facility, program fees, and educational methods. Higher scores were associated with higher satisfaction.

2) The need of trauma nursing continuing education

The need of continuing education was measured using the tool developed by Cheon [9] for nurses. The survey items included the need for continuing education, the subject selection method, instructors, preferred education methods, duration, number of sessions, and priority subjects. There were ten items in this section, including the quality of continuing education, content, instructor, program fees and program schedule, and these were measured on a 5-point Likert scale from 'agree strongly agree' (five points) to 'strongly disagree' (one point), with higher scores indicating a higher level of need.

On the level of need for trauma nursing subjects, a total of 22 items were formed based on an academic call for papers and online and offline educational programs in the previous 3 years. The subjects were asked to choose five subjects. The tool reliability in this study was found to be Cronbach's α=0.927.

Data collection and ethical considerations

The study rationale was communicated to the hospitals beforehand, and the study was conducted after receiving the approval from the heads of the trauma centers of each hospital. Approval was also obtained from the Institute Review Board (IRB) of a general tertiary hospital located in Seoul (IRB 2015-0887).

After approvals were received, data collection took place between March 1, 2017 and May 31, 2017. To provide ethical protection for the subjects, they were provided with explanations about the purpose and contents of the study, as well provided with assurance about anonymity and confidentiality. All participants provided written informed consents, and they were further advised that they could withdraw consent at any time during the study. The data were only used for research purposes and were encoded so that the information was only accessible by the researchers.

Data analysis

Data were analyzed using SPSS Statistics for Windows, version 21.0 (IBM Corp., Armonk, NY, USA). Where applicable, we used frequencies to calculate percentages, means, standard deviations. We compared the findings associated with each hospital, including using one-way ANOVA.

RESULTS

General characteristics

The general characteristics of the subjects are summarized in Table 1. Among the 204 subjects, 185 were women (90.7%), the mean age was 28.8±5.4 years, and 161 were married (78.9%). The mean clinical experience was 72.6±66.5 months, and 85 nurses (41.7%) had between 1-3 years of trauma clinical experience, representing the

Table 1. General characteristics (n=204)

Characteristic	Category	Value
Gender	Female	185 (90.7)
Age (years)		28.8±5.4
Marital status	Married	161 (78.9)
Total clinical experience (months)		72.6±66.5
Trauma clinical experience (years)		
	1-3	85 (41.7)
	3-5	36 (17.6)
	5-10	47 (23.0)
	10	36 (17.6)
Education level (years)	3-year diploma	38 (18.6)
	Bachelor's degree	131 (64.2)
	Attending master's course	19 (9.3)
	≥Master's degree	16 (7.8)
Position	Staff nurse	168 (82.4)
	Nurse specialist	5 (2.5)
	Charge nurse	24 (11.8)
	Manager	6 (2.9)
	Others	1 (0.5)
Work department	Ward	70 (34.3)
	Emergency room	64 (31.4)
	ICU	70 (34.3)
Work satisfaction	Very satisfied	5 (2.5)
	Satisfied	147 (72.1)
	Dissatisfied	47 (23.0)
	Very dissatisfied	5 (2.5)
Experience receiving trauma nursing continuing education programs		
	Yes	86 (42.2)
	No	118 (57.8)
Reasons for not receiving trauma nursing continuing education		
	Could not attend because of work	42 (35.6)
	Did not know about such programs	40 (33.9)
	Did not feel the need for education	5 (4.3)
	Contents of the education were not desirable	31 (26.3)
Number of receiving trauma nursing continuing education by hospital[a]		
	A	6 (7.0)
	B	10 (11.6)
	C	14 (16.3)
	D	10 (11.6)
	E	16 (18.6)
	F	5 (5.8)
	G	25 (29.1)

Values are presented as mean±standard deviation or number (%).
ICU: intensive care unit.
[a]Hospital names are listed as ABCDEFG.

largest subset.

There were 131 nurses (64.2%) with a "Bachelor of Science in Nursing" degree from a 4-year university, with 168 staff nurses (82.4%) and 24 charge nurses (11.8%). Seventy nurses worked in the general wards (34.3%), 70 in the ICU (34.3%), and 64 in the emergency room (31.4%). There were 147 (72.1%) who indicated that they were satisfied with their jobs, followed by 47 (23.0%) reporting dissatisfaction. Four (2.5%) each reported that they were either very satisfied or very dissatisfied. Eighty-six (42.2%) had experience receiving trauma nursing continuing education. Forty-two (35.6%) reported that they could not attend the trauma nursing continuing education program because of work, 40 (33.9%) reported that they did not know of the continuing education programs, 31 (26.3%) reported that they did not find an education program covering what they wanted to learn, and five (4.3%) reported that they did not feel the need for the education program. Of the 86 nurses who received the trauma-related continuing education, G hospital had the most nurses who participated in the program (25, 29.1%) and A hospital had the fewest, with at six nurses (7.0%).

Perceived state of and satisfaction with continuing education, by hospital, among nurses who have participated in trauma nursing continuing education programs

The perceived state of and satisfaction with continuing education at each hospital, among nurses who have

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participated in trauma nursing continuing education programs are summarized in Table 2. Generally, the nurses had only participated in a single trauma nursing continuing education program. In terms of the delivering institution, 18 (20.9%) at G hospital had the most education through the Korea Nursing Association, while nine (10.5%) at C hospital had the most education and showed significant difference (p<0.001).

As for the methods of continuing education, 17 nurses from G Hospital reported that they participated in continuing education through cyber education and e-learning; for other hospitals, face-to-face offline lectures were the majority; the difference between G Hospital and the other centers was statistically significant (p<0.001). There were no significant differences in overall satisfaction with continuing education; however, there were some significant differences among the hospitals according to specific categories, such as program timing (p=0.003), number of participants (p=0.007), and instructor teaching ability (p=0.014).

Need for trauma nursing continuing education

The findings related to the need for trauma nursing continuing education are detailed in Table 3. On the question of whether continuing education is needed, 45.1% responded that it was necessary. Regarding the most appropriate method of selecting the subject for continuing education, 54.9% responded that it is important to conduct a yearly survey of nurses to elucidate their preferred subjects.

The preferred methods of continuing education were face-to-face education (57.8%), simulation education (29.9%), cyber education or e-learning (12.3%). Preferred instructors were specialist nurses (71.1%), doctors (17.6%), and head nurses or nurses with higher qualifications (4.9%). The mean preference for program length was 7.4±4.5 hours, with the most appropriate number of programs being–in order of preference–once a year (68.1%).

This study has asked the subjects to select five subjects that they were interested in learning about from a list of 22 subjects. The ten most cited subjects due were early emergency trauma nursing (n=146), critical care (n=122), traumatic brain injury (n=90), abdominal injury (n=82), chest injury (n=74), traumatic spinal injury (n=71), critical care overview (n=59), case-specific nursing (n=58), trauma mechanisms (n=54) and post-traumatic stress disorder (n=52).

Need for trauma nursing continuing education, by hospital

The educational needs of each hospital are as shown in Table 4. The majority responded that trauma nursing continuing education is required, and there were significant differences among hospitals in terms of responses of 'necessary' versus 'essential'(p=0.089). The most frequently preferred topic selection method was to survey the nurses about their needs on a yearly basis. The most preferred education methods were face-to-face offline lectures and cyber education and e-learning, with significant differences between hospitals (p<0.001). Specialist nurses were the most preferred category of instructors, and there was significant variation in the number of continuing education programs among the hospitals (p=0.043).

DISCUSSION

The present study investigated the perceived state of and need for trauma nursing continuing education programs for trauma nurses in seven trauma center or trauma system. Based on the results of this study, only 86 of the respondents (42.1%) had participated in trauma nursing continuing education. Although the nurses continued to work in hospitals with trauma centers and care systems, not even half of the nurses had taken trauma-related continuing education programs. Even though nurses need continuing education in their work environment, they responded that they could not participate in continuing education in related fields because of their workloads or they did not know of such programs or the programs did not meet their needs [2,10].

Larger hospitals tend to develop their own continuing education programs or select educational programs provided by the Korean Nurses Association [11]. However, regional hospitals realistically lack the opportunities or capacity to develop and facilitate their own continuing education programs, presenting difficulties for the nurses

Table 2. Status and satisfaction of continuing education by hospital, by nurses who have participated in trauma nursing continuing education programs

Characteristics	Categories	A	B	C	D	E	F	G	Total	*p*-value
Number of program sessions										0.555
	Once	6 (7.0)	9 (10.5)	13 (15.1)	10 (11.6)	15 (17.4)	4 (4.7)	24 (27.9)	81 (94.2)	
	2-3 times	0 (0.0)	1 (1.2)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.2)	1 (1.2)	3 (3.5)	
	More than four times	0 (0.0)	0 (0.0)	1 (1.2)	0 (0.0)	1 (1.2)	0 (0.0)	0 (0.0)	2 (2.3)	
Delivering institution										<0.000
	The Korean Nurses Association, or its branches	5 (5.8)	5 (5.8)	4 (4.7)	3 (3.5)	7 (8.1)	4 (4.7)	18 (20.9)	46 (53.5)	
	Hospital or other medical institutions	0 (0.0)	0 (0.0)	9 (10.5)	3 (3.5)	8 (9.3)	1 (1.2)	5 (5.8)	29 (33.7)	
	Universities or associations	0 (0.0)	0 (0.0)	1 (1.2)	1 (1.2)	1 (1.2)	0 (0.0)	0 (0.0)	3 (3.5)	
	Affiliated organizations	0 (0.0)	0 (0.0)	0 (0.0)	3 (3.5)	0 (0.0)	0 (0.0)	0 (0.0)	3 (3.5)	
	No answer	0 (0.0)	3(3.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (2.3)	4 (4.7)	
Education methodology										<0.000
	Face-to-face	9 (3.5)	5 (5.8)	12 (14.0)	10 (11.6)	14 (16.3)	3 (3.5)	6 (7.0)	53 (61.6)	
	Cyber education & e-learning	2 (8.0)	3 (3.5)	0 (0.0)	0 (0.0)	1 (1.2)	2 (2.3)	17 (19.8)	25 (29.1)	
	Simulation education	1 (1.2)	2 (2.3)	2 (2.3)	0 (0.0)	1 (1.2)	0 (0.0)	2 (2.3)	8 (9.3)	
Satisfaction with continuing education		2.6±0.5	3.5±0.5	3.3±0.4	3.4±0.6	2.9±0.9	3.0±0.7	3.2±0.6	3.1±0.7	0.565 0.563
	Not satisfied at all	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.2)	0 (0.0)	0 (0.0)	1 (1.2)	
	Not satisfied	2 (2.3)	0 (0.0)	0 (0.0)	1 (1.2)	4 (4.7)	1 (1.2)	3 (3.5)	11 (12.8)	
	Average	4 (4.7)	5 (5.8)	9 (10.5)	4 (4.7)	7 (8.1)	3 (3.5)	13 (15.1)	45 (52.3)	
	Satisfied	0 (0.0)	5 (5.8)	5 (5.8)	5 (5.8)	3 (3.5)	1 (1.2)	9 (10.5)	28 (32.6)	
	Very satisfied	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.2)	0 (0.0)	0 (0.0)	1 (1.2)	
Satisfaction by item	Location and facilities	3.1±0.4	3.3±0.8	3.3±0.4	3.7±0.6	3.3±0.5	3.2±0.4	3.4±0.5	3.3±0.5	0.137
	Duration	3.0±0.6	3.3±0.5	3.3±0.5	3.6±0.8	3.0±0.4	3.2±0.5	3.2±0.6	3.3±0.5	0.003
	Number of participants	3.3±0.8	3.1±0.7	3.0±0.4	3.8±0.6	3.1±0.5	3.2±0.4	3.0±0.4	3.2±0.6	0.007
	Instructors	3.1±0.4	3.7±0.6	3.2±0.6	3.6±0.5	3.1±0.5	2.6±1.5	3.2±0.4	3.2±0.6	0.014
	Program schedule	3.1±0.4	3.3±0.8	3.2±0.6	3.5±0.7	3.2±0.4	3.2±0.4	2.8±0.5	3.1±0.5	0.119
	Program fees	3.3±0.8	3.1±0.7	3.0±0.6	3.8±0.6	3.1±0.5	3.2±0.4	2.9±0.6	3.1±0.6	0.951
Degree to which continuing education helps with work										0.117
	Not helpful at all	0 (0.0)	0 (0.0)	0 (0.0	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
	Not helpful	2 (2.3)	0 (0.0)	0 (0.0)	1 (1.2)	4 (4.7)	0 (0.0)	1 (1.2)	8 (9.3)	
	Average	4 (4.7)	3 (3.5)	7 (8.1)	1 (1.2)	6 (7.0)	3 (3.5)	11 (12.8)	35 (40.7)	
	Helpful	0 (0.0)	7 (8.1)	6 (7.0)	6 (7.0)	5 (5.8)	2 (2.3)	11 (12.8)	37 (43.0)	
	Very helpful	0 (0.0)	0 (0.0)	1 (1.2)	2 (2.3)	1 (1.2)	1 (1.2)	2 (2.3)	6 (7.0)	

Values are presented as mean±standard deviation or number (%).

Table 3. Need for trauma nursing continuing education

Characteristic	Category	Number of nurses (n=204)
Need for continuing education	Not necessary at all	3 (1.5)
	Not necessary	18 (8.8)
	Average	75 (36.8)
	Necessary	92 (45.1)
	Very much necessary reserarch the nurses' needs every year	16 (7.8)
Methods of selecting the most appropriate continuing education subject	Selected by an expert designated by the institution	17 (8.3)
	Research needs or refer to experts every year	70 (34.3)
	Other	5 (2.5)
	Face-to-face instruction	118 (57.8)
Most preferred continuing education method	Cyber education or e-learning	25 (12.3)
	Simulation education	61 (29.9)
	Head nurse or above	10 (4.9)
Most appropriate instructor	Specialized nurses in each field	145 (71.1)
	Doctor	36 (17.6)
	Professor of nursing	3 (1.5)
	External lecturer	10 (4.9)
Most appropriate duration		7.4±4.5
Most appropriate number of sessions	Once	139 (68.1)
	Twice	47 (23.0)
	More than three sessions	18 (8.9)
Items that should be considered as priority in continuing education	Quality of continuing education	4.54±0.64
	Contents of continuing education	4.64±0.65
	Instructors	4.14±0.83
	Program fees	3.74±0.85
	Timing and duration of education	3.84±0.81
	Educational method	4.14±0.78
	Educational environment	4.04±0.74
	Administrative processing	3.62±0.71
	Attitude of participants	4.02±0.71
	Education time	4.03±0.71
Five subjects you want to study as part of continuing education	Early emergency trauma care	146
	Critical care nursing	122
	Traumatic brain injury nursing	90
	Abdominal injury nursing	82
	Chest injury nursing	74
	Traumatic spinal injury nursing	71
	Overview of severe patients	59
	Case-specific nursing	58
	Case-specific nursing	54
	Post-traumatic stress disorder	52

Values are presented as mean±standard deviation or number (%).

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Table 4. Need for trauma nursing continuing education, by hospital

Characteristics	Categories	A	B	C	D	E	F	G	Total	*p*-value
Need for continuing education										0.089
	Not necessary at all	2 (7.1)	0 (0.0)	0 (0.0)	0 (0.0)	1 (3.7)	0 (0.0)	0 (0.0)	3 (1.5)	
	Not necessary	4 (14.3)	4 (13.3)	0 (0.0)	4 (13.3)	3 (11.1)	2 (7.1)	1 (3.3)	18 (8.8)	
	Average	17 (60.7)	8 (26.7)	10 (32.3)	9 (30.0)	11 (40.7)	10 (35.7)	10 (33.3)	75 (36.8)	
	Necessary	5 (17.9)	16 (53.3)	17 (54.8)	16 (53.3)	10 (37.0)	13 (46.4)	15 (50.0)	92 (45.1)	
	Very much necessary	0 (0.0)	2 (6.7)	4 (12.9)	1 (3.3)	2 (7.45)	3 (10.7)	4 (13.3)	16 (7.8)	
Methods of selecting the most appropriate continuing education subject										0.175
	Research the nurses' needs every year	16 (57.1)	13 (43.3)	20 (64.5)	13 (43.3)	14 (51.9)	16 (57.1)	20 (66.7)	112 (54.9)	
	Selected by an expert designated by the institution	4 (14.3)	3 (10.0)	3 (9.7)	1 (3.3)	1 (3.7)	4 (14.3)	1 (3.3)	17 (8.3)	
	Research needs or refer to experts every year	7 (25.0)	11 (36.7)	8 (25.8)	16 (53.3)	11 (40.7)	8 (28.6)	8 (28.6)	70 (34.3)	
	Other	1 (3.6)	3 (10.0)	0 (0.0)	0 (0.0)	1 (3.7)	0 (0.0)	0 (0.0)	5 (2.5)	
Most preferred continuing education method										0.001
	Face-to-face instruction	14 (50.0)	17 (56.7)	22 (71.0)	23 (76.7)	17 (63.0)	15 (53.6)	10 (33.3)	118 (57.8)	
	Cyber education or e-learning	3 (10.7)	3 (10.0)	1 (3.2)	1 (3.3)	3 (11.1)	2 (7.1)	12 (40.0)	25 (12.3)	
	Simulation education	11 (39.3)	10 (33.3)	8 (25.8)	6 (20.0)	7 (25.9)	11 (39.3)	8 (26.7)	61 (29.9)	
	Head nurse or above	1 (3.6)	2 (6.7)	2 (6.5)	0 (0.0)	1 (3.7)	2 (7.1)	2 (6.7)	10 (4.9)	
	Specialized nurses in each field	19 (67.9)	19 (63.3)	19 (61.3)	27 (90.0)	22 (81.5)	18 (64.3)	21 (70.0)	145 (71.1)	
Most appropriate instructor										0.406
	Doctor	6 (21.4)	7 (23.3)	9 (29.0)	2 (6.7)	2 (7.4)	4 (14.3)	6 (20.0)	36 (17.6)	
	Professor of nursing	0 (0.0)	1 (3.3)	0 (0.0)	1 (3.3)	0 (0.0)	0 (0.0)	1 (3.3)	3 (1.5)	
	External lecturer	2 (7.1)	1 (3.3)	1 (3.2)	0 (0.0)	2 (7.4)	4 (14.3)	0 (0.0)	10 (4.9)	
Most appropriate number of sessions										0.043
	Once	15 (53.6)	21 (70.0)	23 (74.2)	26 (86.7)	20 (74.1)	22 (78.6)	14 (46.7)	141 (69.1)	
	Twice	11 (39.3)	7 (23.3)	4 (12.9)	3 (10.0)	6 (22.2)	4 (14.3)	10 (33.3)	45 (22.1)	
	More than three sessions	2 (7.1)	2 (6.7)	4 (12.9)	1 (3.3)	1 (3.7)	2 (7.1)	6 (20.0)	18 (8.8)	

Table 4. Continued

Characteristics	Categories	A	B	C	D	E	F	G	Total	*p*-value
Items that should be considered as priority in continuing education	Quality of continuing education	4.40±0.10	4.51±0.14	4.51±0.12	4.72±0.31	4.72±0.30	4.52±0.72	4.41±0.11	4.45±0.11	0.384
	Contents of continuing education	4.11±0.11	4.74±0.12	4.51±0.13	4.73±0.22	4.62±0.11	4.62±0.11	4.61±0.12	4.51±0.11	0.629
	Instructors	4.11±0.11	4.11±0.11	4.14±0.12	4.24±0.21	4.12±0.12	4.23±0.12	4.22±0.11	4.01±0.12	0.905
	Program fees	3.61±0.22	3.72±0.22	3.51±0.11	3.52±0.11	3.74±0.11	4.01±0.12	3.61±0.12	3.82±0.11	0.292
	Timing and duration of education	3.81±0.11	3.82±0.14	3.91±0.14	3.91±0.11	3.82±0.12	4.02±0.12	3.52±0.11	3.91±0.21	0.265
	Educational method	3.92±0.11	4.25±0.12	4.02±0.12	4.44±0.12	4.03±0.11	4.31±0.11	3.91±0.12	4.23±0.11	0.056
	Educational environment	3.91±0.12	4.02±0.13	4.04±0.13	4.32±0.13	4.03±0.12	4.22±0.12	3.92±0.11	3.92±0.11	0.265
	Administrative processing	3.81±0.11	3.52±0.12	3.61±0.14	3.93±0.12	3.54±0.11	3.71±0.11	3.41±0.21	3.62±0.11	0.104
	Attitude of participants	3.91±0.13	4.04±0.15	4.03±0.12	4.34±0.15	4.04±0.11	4.02±0.12	3.91±0.13	3.91±0.12	0.593
	Education time	4.11±0.21	4.12±0.12	4.02±0.15	4.23±0.12	4.05±0.11	4.03±0.12	3.72±0.12	4.02±0.11	0.326

Values are presented as mean±standard deviation or number (%).

at these facilities to participate in programs that are appropriate for their work. Currently, trauma centers are located in areas outside of Seoul [9]. Moreover, nurses in regional hospitals which cannot engage in continuing education programs within their hospitals with accreditation from the Korean Nurses Association must select continuing education programs outside the hospital; as such, these programs may not be suitable to provide guidance or skills related to the situations that they encounter at the hospitals they work in [6,12]. In reality, it can be difficult for the nurses from regional trauma centers to travel long distances and coordinate their work schedules to attend lectures and seminars in larger cities [13,14]. Moreover, they lack information on the schedules of continuing education programs, underscoring the need for better advertising of trauma nursing educational programs.

Most of the participants who had received continuing education had only undergone one program. Particularly, the delivery formats of trauma nursing continuing education programs were generally developed by the Korean Nurses Association. As the nurses utilize continuing education programs facilitated by the Korean Nurses Association, as well as other associations and individual hospitals, the operations of such programs will have a large impact on clinical practice.

Hospitals should develop educational programs that fit the needs and requirements of nurses, helping them to utilize practice and theory accurately and effectively in the clinical setting. Continuing education programs were reported as having been delivered by doctors (50%), specialist nurses (47.7%), and head nurses (36.0%). But the desired instructors were–in the order of participant preference–specialist nurses (71.7%), doctors (17.6%), and head nurses (4.9%). This is similar to the findings reported by Kim et al. [15] and Cheon [9], with the nurses having high educational expectations with specialist nurses, with whom they would share the most practical and realistic experiences and knowledge. Based on these study results, it would be necessary to further strengthen instructor pools with professional nurses and skilled clinical nurses to improve the effects of continuing education when developing such educational programs [9,15].

The most preferred method of continuing education was face-to-face lectures, according to 57.8% of partic-

ipants, and the subjects responded that they preferred offline, lecture-style education over cyber education and e-learning. offline methods of program delivery have the advantage of participants being directly involved with the educational process, which is closely related to the expectations of utilizing newly acquired skills and knowledge in clinical practice [10,15]. In an era of increasing cyber education, with the rise of information technology and the Internet, it would be necessary to make online trauma nursing education more realistic and more applicable to clinical practice.

The mean satisfaction level of continuing education operations, as cited by nurses who have received trauma-related continuing education programs, was 3.1 points; among the six satisfaction-related items assessed by the questionnaire, educational methods and program fees produced lower scores than the others, but the highest scores were associated with quality of education, the content, and the instructor ability.

These results are different from those reported by Kim et al. [15], who found a high satisfaction with program fees, education duration, and quality of continuing education, as well as different from Cheon [9], who reported high satisfaction with the timing and duration of continuing education programs. This study indicated a high satisfaction for quality and instructors of trauma-related continuing education; this indicates the importance of securing instructors with abundant clinical experience, who can teach subjects that can be practically applied in clinical practice.

The participants were asked to select five preferred trauma-related topics for continuing education, and early emergency trauma nursing and critical care nursing showed the highest levels of preference. It appears that nurses are very interested in these topics, as the majority of patients admitted to trauma centers are severe trauma patients with serious traumatic injuries, and emergency care and care at the ICU are critical to preventing mortality. Aside from early emergency trauma nursing and critical care nursing, nurses also indicated interest in specific types of nursing. It would be important for the individual institutions to establish educational programs and engage in regular, repetitive programs so that many nurses could participate in education on high-demand topics, irrespective of age or experience.

Differences in the operating demands for trauma nursing continuing education according to the general characteristics of the subjects indicated that nurses below the age of 25 and those with low levels of clinical experience emphasized the number of programs, and those over the age of 40 emphasized the importance of instructors. It might have been expected that younger nurses with little experience would have indicated interest in more programs and that nurses 40 years of age or older would have rich clinical experience, thus desiring instructors who can deliver education on higher-level care. As the majority of continuing education programs are developed and operated irrespective of the work environment, or participant age and experience, it appears that educational programs should be better tailored to the characteristics and needs of prospective pupils. This is also discussed by Jho et al. [16], and conducting continuing education programs specific to the characteristics of the nurses allows for improved satisfaction and higher utilization of acquired knowledge and skills in clinical practice. It would be potentially helpful to divide the educational programs into basic programs with simple-to-understand concepts and higher-level nursing programs depending on age and experience.

While this study attempted to be true to the population by matching the proportion of nurses in each trauma center, a limitation is that this study failed to consider proportions of general characteristics, such as age, gender, and work experience. Moreover, this study covered seven trauma centers, and caution should be taken in generalizing our results and conclusions. However, the survey covered nurses who are dedicated to trauma patients, exploring the perceived state of and the need for trauma nursing continuing education based on their responses; as such, this study is significant and could be used as baseline data in the development and improvement of trauma nursing continuing education programs.

CONCLUSION

The results of this study show that trauma nurses are aware of the importance and need for education. Contin-

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ued and systematic training is required by organizing education programs that reflect the needs of nurses, such as education topics, teaching methods, and instructors etc. based on the results of this study, the education program is proposed to be developed and operated, and well-organized education is expected to have a positive effect on nursing performance.

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