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Assessing Needs for Practical Training in Intensive Care Unit to Enhance Nursing Education: A Focus Group Interview

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Assessing Needs for Practical Training in Intensive Care Unit to Enhance Nursing Education: A Focus Group Interview

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Purpose : The demand for skilled critical care nurses and the significant impact of the practice-readiness gap underscore the need for educational programs bridging nursing education and clinical practice. This would ensure safe, high-quality patient care and a stable workforce. This study aimed to explore the educational needs of critical care nurses to develop an essential nursing education program for nursing students, addressing the practice-readiness gap they may encounter as new nurses. **Methods :** The study espoused a qualitative approach by utilizing focus group interviews conducted in South Korea in April and May 2022. A total of 11 nurses participated in the study. Data were collected from three focus groups, each consisting of three to four nurses from intensive care units. Focus group interviews were conducted using a semi-structured questionnaire. Content analysis was performed on the interview data using thematic analysis. Ethical approval for the study was obtained from the institutional review board. **Results :** Nursing education programs in intensive care units should prioritize fundamental nursing competencies such as basic nursing and physical examinations. Participants' critical care nursing education needs were categorized into four main themes: holistic nursing competency, advancement of practical education, skilled communication, and systematic critical care nursing education. **Conclusion :** The study's findings provide valuable insights and guidelines for developing critical and intensive care nursing education programs tailored for nursing students.

Key words : Intensive care units, Education, Nursing, Qualitative research

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I. INTRODUCTION

1. Necessity of the study

The demand for highly skilled critical care nurses has steadily increased with the increasing complexity of care required in intensive care units (ICUs) [1]. ICUs require dedicated and adaptable nurses who are proficient in operating advanced equipment and possess comprehensive nursing skills and knowledge [1]. In addition to basic nursing and emotional care, critical care nursing requires specialized nursing practice competencies. Readiness for nursing practice refers to the adaptability of new nurses to the workplace and their ability to perform nursing tasks well [2]. Readiness for nursing practice comprises various components such as performing nursing activities, understanding workflow, using clinical judgment, prioritizing abilities, and having confidence in patient care skills [3].

However, training new nurses is often insufficient to meet the challenges and demands of critical care settings [4]. When new nurses are underprepared for the nursing practice, they struggle to implement their theoretical knowledge, perform poorly in their nursing roles, and experience job strain and stress, resulting in workplace maladjustment [5]. This maladjustment, in turn, affects turnover intention [6,7]. Inadequately prepared nurses may struggle to make critical decisions, prioritize tasks, and communicate effectively with patients, families, and other healthcare professionals [4]. This can increase the incidence of medical errors and delays in patient recovery, thereby negatively impacting patient safety [8]. Therefore, if nursing students are well-prepared for critical care settings through their nursing program curriculum, it can bridge the gap between education and clinical practice and lead to successful adaptation at work [9].

The approach in universities providing clinical practice education has shifted more toward observation, leading to fewer opportunities for direct nursing practice. Various factors, including an emphasis on infection control and patient safety, have contributed to this shift in their approach [10]. Critical care nursing, which includes patients with severe illnesses and complex medical equipment, can provide limited experience to nursing students and further widen the practice-readiness gap. This highlights the need to understand the state of practice-readiness required by nursing in clinical settings and develop educational programs that prepare nursing students for clinical practice, ensuring that they are well-equipped to meet the demands of critical care nursing after entering the workforce.

In South Korea, a 2016 study examining the status of theoretical and practical education in critical care nursing in 185 nursing schools revealed that only a limited number of schools (42 schools in total, 22 for academic education and 26 for practical education) offered education in critical care nursing [11]. Among the 26 schools providing practical education, only eight exclusively focused on critical care nursing practice, and 21 offered it as a major elective. The extent of critical care practice education varies across institutions, potentially widening the practice-readiness gap for new ICU nurses. The coronavirus disease (COVID-19) pandemic disrupted training and sometimes led to deployment without sufficient preparation. This indicates the need to develop new critical care nursing practice education programs incorporating various educational media and pedagogies that complement the current observation-based practice education.

Recent studies on educational programs for nurses in critical care nursing in Korea include a patient safety simulation program [12] and a

virtual reality-based ventilator-applied patient nursing education program [13]. Studies among nursing students include web-based ventilation management education programs [14] and simulation education programs using mannequins [15]. However, these programs are limited to educational programs that use various educational content and media.

Therefore, critical care nursing practice education programs must be developed to improve nursing students' competencies and reduce the practice-readiness gap. It is crucial to identify critical care nursing education needs to achieve this. Previous studies on nursing students' critical care nursing education needs are scarce. Furthermore, qualitative research is required to explore specialized content, such as critical care nursing, in detail. Focus group interviews provide deep and rich data through interactions between group members in response to the researcher's questions by including participants with in-depth experience of the research topic [16]. The present study aimed to explore the educational needs of critical care nursing education among nurses with experience in intensive care units and suggest the content and direction of critical care nursing practice education for nursing students to develop an education program that meets the requirements of the clinical setting and equips future nurses with required competencies.

2. Purpose of the study

This study explored the educational needs of ICU nurses to develop a practice-oriented critical care nursing program for nursing students by focusing on their experiences and requirements.

II. METHODS

1. Study design

This qualitative study collected data using focus group interviews (FGI) in which participants with similar experiences discussed a specific topic based on their experiences.

2. Setting and sample

We recruited nurses posted in ICUs at three public general hospitals in Gyeonggi-do, with bed capacities ranging from 100 to 300. The inclusion criteria required a minimum of one year of ICU experience, an understanding of the study's purpose, and voluntary consent. We used purposive sampling to recruit participants who could provide diverse perspectives and opinions on intensive care unit nursing experience. First, we contacted the nursing departments of general hospitals with ICUs, explained the study objectives, and obtained permission for the interviews. Then, we reached out to the head nurse of each ICU to obtain recommendations about nurses willing to share their experiences. During this process, we coordinated and scheduled interviews with the recommended nurses. Finally, we recruited 11 participants and divided them into three focus groups, with three to four participants in each group. Generally, it is recommended to interview a focus group with six to eight participants [17]; however, the group size has been found to vary from three to twelve in the previous literature [16]. The group size may depend on the type of research question and the nature of the group. Small groups are more appropriate for gaining in-depth insights or when participants have more field experience, and large groups are more

appropriate when participants have insufficient knowledge of the topic [17]. Several authors [17, 18] have suggested that only three or four focus groups are necessary for a simple research question. The present study divided critical care nurses into smaller groups for in-depth discussions.

3. Ethical consideration

This study received ethical approval from the institutional review board of the researchers' institution (Approval no. GWNUIRB-2022-10). The participants were informed about the purpose and methods of the study, the recording of interviews, privacy considerations, and their right to withdraw from the study without penalty. Informed consent was obtained from all participants before their participation.

4. Data collection

Data were collected using focus group interviews between April and May 2022. The interviews were conducted until data saturation was achieved. Eleven participants were divided into three groups. Each group was interviewed separately. The first author (SP) had experience in conducting qualitative interviews and facilitated all focus group interviews, which lasted approximately one hour each. A previous study on educational needs was used to develop the semi-structured interview questions [19-21]. The interview questions were organized into Krueger's five-stage categories [17]: opening, introductory, transition, key, and ending questions. Specific interview questions included, "Please tell us about your experience of caring for critically ill patients" (opening question), "Based on your experience, what do you think should be included in critical care nursing education for nursing students, new nurses, and experienced nurses?" (introductory question), "Please tell us about the content and level of critical care nursing education required for nursing students" (transition question), "What educational elements should be important in critical care nursing education for nursing students?" (key question), "What nursing skills should be important in critical care nursing education for nursing students?" (key question), "What should be included in education programs at the university level to increase critical care nursing competency?" (key question), and "Finally, please feel free to comment if you have any additional thoughts regarding critical care nursing education" (ending question).

Due to the COVID-19 pandemic, the interviews were conducted remotely using video conferencing. The participants were interviewed in Korean before or after their shifts, either in a hospital conference room or their homes. The interview was moderated by the first author, who shared the interview questions on an online screen to facilitate appropriate responses and encourage participants to share their experiences. Additionally, the moderator encouraged participants to engage in an unrestricted discussion while reflecting on and summarizing their comments and seeking additional clarification. At the end of each question, the participants were allowed to provide additional comments. The moderator moved to the following question in the absence of further comments.

The interviews were conducted on the online Zoom platform. Screen and voice recordings were made with the participants' consent. After the interviews, the voice recordings were transcribed using Naver's Clovanote service, and the researcher repeatedly listened to the voice recordings to identify and correct any errors in the transcriptions. The screen recordings were used to analyze the participants' behaviors, tone of voice, and interview atmosphere.

5. Data analysis

The collected data were analyzed using the thematic analysis method described by Braun and Clarke [22]. The analysis process involved six steps: becoming familiar with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and presenting the findings. The first author coded the data and identified the potential themes. The second author reviewed and agreed upon the results. The FGI transcripts were thoroughly examined during the initial coding phase to extract relevant phrases or sentences about ICU nurses' nursing experiences and educational needs. Potential themes were explored by grouping the codes using a thematic map, which helped visualize the relationships between codes, themes, and different levels of themes. Similar or overlapping potential themes were merged, new themes were introduced when necessary, and irrelevant themes were discarded. This iterative process led to finalizing the themes, each given a clear name and definition.

6. Researchers' reflections

This study's first author (SP) has studied qualitative research methodology in graduate school, conducted several qualitative studies, and served as a reviewer for qualitative nursing studies in major nursing journals. Additionally, the researchers (SP and BK) are experienced in teaching critical care clinical practice at a university. They conduct various simulation training sessions, including critical care scenarios, as Professors in charge of the on-campus simulation practice. The researchers initiated this study to explore elements of education programs that could improve nursing students' critical care competencies. To further explore and understand the need for critical care nursing education, the researchers identified the following biases and preconceived notions to distance themselves during the research process: "Current critical care nursing education for nursing students is inadequate" and "Critical care nursing education is disconnected between school and clinical practice."

7. Trustworthiness of the study

We applied Lincoln and Guba's criteria [23] for credibility, transferability, dependability, and conformability to ensure the study's validity. We ensured credibility by transcribing the participants' languages verbatim. We considered the participants' attitudes, tone, and mood in the recorded videos to ensure the accuracy of the data. Afterward, the data were analyzed following the thematic analysis procedure. We compared and reflected on the original data multiple times to ensure that the results represented the participants' experiences, increasing their reliability. We ensured the transferability of the findings to similar contexts or situations by considering the diverse characteristics of the participants (career, status, age, etc.) to describe the phenomenon in detail. Additionally, we have cited relevant statements in the results so that the readers can judge the applicability of the results in similar contexts and situations. To ensure the study's dependability, we conducted ongoing reflexive checks to verify the accuracy of the results, interpretations, and conclusions. This involved consistently aligning the findings with collected data to ensure robust support. Furthermore, we have included detailed descriptions of the participant selection, data analysis, and research procedures, allowing readers and other researchers to follow the study's progression easily. This transparent approach ensured the study's consistency and traceability throughout the rese-

arch process. To ensure conformability and minimize the influence of the researchers' perspectives, the researchers listened to the participants without judgment and maintained a distance from their perspectives and preconceived notions by identifying and bracketing the contents of critical care nursing education, educational needs, and preconceived notions in advance.

III. RESULTS

Table 1 presents the characteristics of the 11 participants in this study. The thematic analysis of the interview data resulted in 21 codes from 129 meaningful statements, which were categorized into four main themes and eight subthemes (Table 2).

1. Theme 1: Holistic Nursing Competency

The participants recognized the significance of prioritizing education that strengthens basic nursing competencies and promotes the ability to provide holistic nursing care to patients. They emphasized that this training should precede advanced training on complex medical equipment and specific critical illnesses in the ICU.

1) Back-to-basics competency

"Back-to-basics competency" includes training in systematic critical care assessment skills, such as evaluating consciousness levels and physical exams, and fundamental nursing skills, such as personal hygiene care and infection control. The participants emphasized the importance of explicit instruction on foundational concepts and principles within nursing theory, such as fractions of inspired oxygen. These competencies, deemed vital for ICU nurses, directly influence the treatment of critically ill patients requiring comprehensive care and are essential for providing holistic care in a critical environment.

"I believe that basic nursing skills hold significant importance. Skills such as intravenous injections, suctioning, and other essential tasks contribute to a comprehensive approach that is more prevalent in the ICU compared with general wards." (Participant 5)

"I believe starting with physical examination and consciousness level assessments is essential. These form the foundation upon which we can build [our practice]." (Participant 8).

"I have noticed that new nurses nowadays often

Table 1. Characteristics of the Participants (*N*=11)

ID	Sex	Age (years)	Current position	Career as intensive care unit RN	Number of beds in the hospital	Focus group
1	Female	44	Head nurse	3 years 9 months	213	3
2	Female	39	Nurse	6 years 10 months	213	3
3	Female	32	Nurse educator	2 years 2 months	213	3
4	Female	56	Head nurse	22 years	172	1
5	Male	37	Nurse	8 years	172	1
6	Female	46	Nurse educator	2 years 7 months	172	1
7	Female	34	Nurse	5 years	206	2
8	Female	36	Nurse	8 years 11 months	206	2
9	Female	28	Nurse	4 years	206	2
10	Male	47	Nurse	16 years	172	1
11	Female	29	Nurse	2 years	206	2

RN=Registered nurse.

Table 2. Main Themes, Subthemes, and Codes for Critical Care Nursing Education Needs

Main theme	Subtheme	Code
Holistic nursing competency	Back-to-basics competency	Basic nursing skills, level of consciousness assessment, and systematic physical examination skills Accurate and precise education on theories and concepts
	Person-centered nursing competency	Attitude toward unconscious patients Ability to anticipate the condition of (non-verbal) patients Empathy for patients and their caregivers
Advancement of practical education	Strengthening the theory-practice link	Disconnect between theoretical education and practical training Limited transfer of school education (theory and practice) to real-world scenarios Discrepancies between learning in theory and practice Improvement and enhancement of clinical practice learning and teaching methods
	Enhancing proficiency in nursing skills	Reliance on current clinical practice in observation Importance of hands-on learning for nursing skills Need for repetitive training in basic nursing skills Requirement for high-frequency critical care nursing practice
Skilled communication	Assertive communication skill	Communication skills for situations requiring immediate attention, such as restraints, critical care, etc. Challenges encountered in communicating with caregivers regarding end-of-life issues Communication skills in response to complaints or inappropriate demands from caregivers
	Strengthen interprofessional communication	Organized reporting skills related to patient status reporting How to respond to physician feedback on patient reports
Systematic critical care nursing education	Customized education based on experience	Need for tailored education programs for nursing students, new nurses, and experienced nurses
	Strategic development of experienced nurses	Experienced nurses are well-suited for roles in the intensive care units Need for organized in-hospital training for experienced nurses Need for critical care nursing guidelines or protocols

lack proficiency in the most basic aspects. They are unfamiliar with medical terms, and abbreviations commonly used in the field and lack a basic understanding of assessing consciousness levels. Consequently, there are numerous instances where we have to reteach them." (Participant 1)

2) Person-centered nursing competency

"Person-centered nursing competency" emphasizes the recognition that most critically ill patients cannot communicate their needs because of their unconscious state. Therefore, nurses must be able to provide care that respects patients' unique needs and values. This involves being attentive to the patient's physical and psychological needs and delivering compassionate care that demonstrates a comprehensive understanding of their requirements. Therefore, training is necessary to enhance empathy for and promote dignity among critically ill patients.

"The approach to treating a critically ill patient is distinct because they cannot verbally communicate their needs. Thus, training should focus on cultivating a specific mindset when dealing with these patients. It's not simply a matter of

them being non-verbal, but understanding the unique mindset required when caring for a critically ill patient."(Participant 1)

2. Theme 2: Advancement of Practical Education

Participants emphasized the importance of practical education and hands-on experience in developing critical care nursing competencies and the necessity of exposure to the ICU atmosphere and workflow. They suggested that clinical practice education could be improved by integrating theory and practice, enhancing observation-based learning, and strengthening nursing skills.

1) Strengthening the theory-practice link

The participants emphasized the need for an integrated approach to theory and practice in nursing education. They noted that new nurses often need help with the disconnect between what is taught and practiced, with current education relying mainly on observational learning. This gap can be bridged by strengthening preparatory learning, fostering collaboration between hospitals and educational institutions, and expanding the role of clinical professors to provide systematic guidance. Enhancing case study learning was also highlighted to deepen students' understanding of critical care nursing.

"I believe there should be a seamless connection between systematic nursing education and high-frequency practice. It is crucial to establish a solid link between the basic nursing skills in school and their practical application [during clinical practice]. Even during their practice, most nursing students primarily observe rather than actively participate." (Participant 6).

"When I was new, I experienced some difficulty owing to the gap between the theoretical knowledge taught in school and the practical application. There were instances where we had to deviate from the treatments we learned in theory." (Participant 5)

"I believe that the role of clinical professors or senior leaders should be strengthened to ensure that students gain greater familiarity and exposure during hospital practice." (Participant 6).

2) Enhancing proficiency in nursing skills

The participants expressed concerns about current clinical practice education, which is primarily observation-based, leading to limited hands-on experience and proficiency in nursing skills. They emphasized enhancing basic skills through practical education in critical care nursing at the university level and underscored the need for training in advanced skills specific to critically ill patients. Essential areas for practical ICU training include basic nursing skills, physical examination, emergency care, response to medical equipment alarms, and administration of critical patient medications.

"Students end up mostly observing, which leaves them ill-prepared when they become new nurses. It would be beneficial for schools to provide ample opportunities for hands-on practice."(Participant 5)

"As someone who currently trains new nurses, I have noticed that they often behave as if they are hearing information for the first time or lacking essential knowledge. It would be beneficial to reinforce education on basic nursing skills repeatedly." (Participant 3)

3. Theme 3: Skilled Communication

The participants stated that most new nurses were unable to provide appropriate responses to caregivers in situations such as end-of-life care (e.g., conflicting and unreasonable demands for treatment by caregivers), application of body restraints, and pressure ulcers, and had difficulty in communicating with physicians while reporting

the patients' conditions. Furthermore, they stressed the importance of teaching practical communication skills in diverse ICU situations within the educational curriculum.

1) Assertive communication skill

The participants highlighted the need to improve ICU nurses' assertive communication skills in sensitive situations, such as end-of-life care, physical restraint, managing pressure injuries, and unreasonable caregiver demands. They mentioned that assertiveness involved the expression of one's perspective clearly and directly.

> *"When caregivers entrust their loved ones entirely to the nurses, they may express dissatisfaction if pressure ulcers or similar issues arise. New nurses have often lacked the necessary communication skills to address these concerns. Hence, practical education on communication skills and related aspects should be provided in school."* (Participant 4)
>
> *"When a patient is on a ventilator, restraints are necessary. However, caregivers may feel distressed seeing their loved ones in [what they perceive to be] discomfort and may repeatedly request the removal of the restraints. Unfortunately, one common mistake new nurses make is giving in to these requests. It is crucial to develop effective communication skills that allow nurses to establish boundaries and avoid engaging in actions that exceed their scope of responsibility within the nurse-patient relationship."* (Participant 7).

2) Strengthen interprofessional communication

The participants stated that they required training to strengthen their communication with doctors for patient safety. This included communication skills training to report and receive feedback on a patient's condition systematically and seek clarification from the doctor if their feedback was inadequate to improve the patient's condition.

> *"I think new nurses or nurses with less clinical experience sometimes get scolded (by doctors) because they do not know where to start and how to report the patient's condition. So, I think that it would be good to learn the basic process of reporting patient conditions and getting feedback through SBAR training during their nursing education."* (Participant 5)
>
> *"To what extent should I report the patient's status? When I get feedback on what I have reported, I am unsure if it is correct?... In the beginning, there are so many instances where I'm just like, 'Oh, I think this is going to send the patient in the wrong direction,' and that is the hardest part."* (Participant 8)

4. Theme 4: Systematic Critical Care Nursing Education

The participants acknowledged the unique characteristics of the ICU compared with general wards, including the severity of patient conditions, the presence of complex medical equipment, and the specific nursing tasks involved. They emphasized the importance of developing phased and systematic education programs for nursing students, new nurses, and experienced nurses to address these differences. They also highlighted the need for hospitals to establish strategic training programs for experienced nurses in critical care settings.

1) Customized education based on experience

Critical-care nursing education should be customized according to the levels and needs of nursing students, new nurses, and experienced nurses. Nursing students' education should focus on basic nursing care, physical examinations, basic theoretical concepts, and basic medical equipment principles. New nurses should receive

education that provides an overall understanding of critical care nursing tasks and the ability to prioritize them. Experienced nurses should develop the ability to provide sufficient knowledge and evidence-based nursing care as preceptors who train new nurses.

> *"It would be good if nursing students could grasp the basics well. New nurses should take some time to get comfortable in the hospital setting before diving into training. They need to develop a sense of priority in patient care, and training can certainly help with that. Experienced nurses can make a difference by receiving high-quality nursing education."* (Participant 11.)

2) Strategic development of experienced nurses

Some participants acknowledged that experienced nurses were better suited to the demanding role of critical care nursing. They emphasized the need for systematic education within hospitals to develop experienced nurses into competent critical care nurses.

> *"In critical care nursing, you often have to handle emergency patients. Dealing with these emergencies requires significant clinical experience and personal readiness. New nurses often feel overwhelmed by these situations and may choose to step away."* (Participant 1)
>
> *"I believe ICU work may be challenging for new nurses, and I would prefer to see colleagues who have been in the field for two or three years taking on these roles."* (Participant 4)

IV. DISCUSSION

The present study employed focus group interviews to obtain qualitative data from critical care nurses on their educational needs for critical care nursing education and propose the content and direction for nursing students. Nurses' perceptions of critical care nursing education were categorized into four main themes, eight subthemes, and 21 codes. The four main themes included holistic nursing competency, advancement of practical education, skilled communication, and systematic critical care nursing education, which were analyzed to enhance our understanding of the participants' perspectives on the educational needs of critical care nursing for nursing students.

The first theme, "Holistic nursing competence," highlights the importance of basic nursing care and human-centered skills over advanced technical training. Participants emphasized the significance of mastering foundational competencies such as accurate observation, examination, and care for critically ill patients. These fundamental skills are essential for understanding nonverbal patients, making informed decisions, and delivering person-centered holistic nursing care. According to Lakanmaa et al. [24], critical care nursing competencies include basic professional care, leadership, patient-centered care, and ethical care, aligning with our participants' emphasis on basic skills and recognition of the need for advanced training. These findings suggest that institutions of nursing education should reassess and reinforce education on basic nursing skills, physical examinations, and understanding concepts and theories through curriculum enhancement and innovative teaching methods.

Participants identified a distinct need for training in person-centered care in the ICU, where individualized care and respect for critically ill patients are crucial. This aspect of nursing is essential in all healthcare settings, but even more so in the ICU, where patients often require total care [25]. In Korea, the nursing curriculum for students and practicing nurses requires a more systematic education on person-centered care. The education provided is fragmented and primarily consists of

case-study- and design-thinking-based approaches [26,27]. Furthermore, Korean nursing students have shown a lower orientation toward person-centered care than students in other countries such as Finland and Portugal [28]. Educational interventions are needed to enhance Korean nursing students' awareness of and competencies in person-centered care. ICU nurses should be capable of preserving the patient's identity [25] and ensuring their protection by genuinely empathizing with patients and understanding their unique circumstances, beliefs, and values [29]. Person-centered critical care nursing is informed by compassion satisfaction [30,31], emotional intelligence [31], and communication competence [30], which should inform the development of educational programs to cultivate ICU nurses' person-centered nursing competencies and attitudes.

The second theme, "Enhancing practical education," highlights the need to bridge the gap between nurses' clinical experiences and practical skills. Participants emphasized the importance of systematic guidance in strengthening nursing skills, and a Korean study [32] found similar needs, including simulation-based practices. Our participants recognized that new nurses often felt underprepared for clinical practice due to the gap between their education and clinical settings. Similar findings have been reported in a study of new Polish nurses in which most felt unprepared to work in the ICU immediately after graduation [4]. Practicing nurses and educators agree that the skills required of nursing graduates today differ from those needed five to ten years ago [33]. Only 39% of practicing nurses believed that current education adequately prepares new nurses. This suggests the need for a systematic academic–practice partnership to align practical education with the needs of the clinical environment.

Practical nursing education should adapt to the paradigm shifts that have accelerated the digital transformation of education and increased the utilization of technology in nursing education [34,35]. The positive role of technology-based education in preparing nursing graduates has been recognized globally [4,33]. Educational methods that have been used to promote critical care nursing competency among nursing students include e-learning programs [36], simulations using a high-fidelity human simulator [15], PBL-based simulations [37], and virtual reality simulations [38]. Therefore, institutions and hospitals should actively utilize technology-based critical care nursing practice programs that provide realistic and repetitive training, mainly when ICU training sites are in short supply.

The participants also stressed the need for systematic guidance during clinical practice and the introduction of a clinical professor system dedicated to practical training. The ICU environment enhances quality learning [39]. However, combining nursing duties with student education in Korea hinders systematic guidance [40]. To address this issue, educational institutions and hospitals should provide practice-oriented education with professional advice. The Korean government is actively promoting the clinical nursing professor system by employing hospital adjunct professors [41]. Coordinated efforts by hospitals, educational institutions, and the government are necessary to expand this system and ensure its stability and effectiveness. The participants emphasized the importance of comprehensive in-school practice for nursing students to develop proficient nursing skills. They observed that the current clinical practice focuses mainly on observation, requiring more critical care nursing skills training. Only a few nursing schools in Korea include critical care nursing courses [11]. Students' critical care nursing competencies can be boosted by integrating these subjects, providing

opportunities for repeated learning, and utilizing technology-enhanced education.

The third theme, "Skilled communication," stresses developing practical communication skills among new nurses in critical care settings. The participants stated that new nurses often could not provide appropriate responses to caregivers in situations such as end-of-life care, the application of body restraints, and pressure ulcers. Additionally, they emphasized that new nurses required better communication skills to report patients' conditions to physicians. These findings are consistent with previous studies that have identified communication with patients, caregivers, and healthcare professionals as a crucial aspect of critical care nursing [4,42]. Qualitative research on ICU nurses' communication experiences has revealed that nurses recognize communication as an integral part of providing care; however, they experience challenges in effectively communicating with caregivers and ventilated patients. A survey on communication-related training needs of new ICU nurses found that although new ICU nurses perceived communication with physicians as important, their level of effective communication with physicians was still low [43]. Furthermore, the highest communication training need of new ICU nurses was communication with physicians. They reported difficulty identifying the patient's condition because of insufficient nursing knowledge and ineffective communication during emergencies [43]. An integrative review study determined that simulation education methods for nursing students, including the use of simulators and standardized patients, could assist them in learning to communicate with patients and caregivers. However, most of these simulations focused on specific diagnoses and did not emphasize communication [44]. Therefore, it is necessary to develop and apply scenarios that present challenging interactions with critically ill patients and their caregivers to prepare nursing students for the potentially complex communication situations they may encounter in critical care settings. Previous studies have demonstrated the effectiveness of a stepwise communication education program using SBAR (situation, background, assessment, and recommendation) and field practice-based interprofessional education in enhancing nursing students' communication skills and self-efficacy [45,46]. Based on these findings, various communication scenarios involving healthcare teams in ICU settings should be developed and incorporated into the nursing curriculum. Furthermore, SBAR-based interprofessional education should be integrated into the bachelor's degree program to enhance nursing students' communication skills, which are necessary for effective collaboration in critical care environments.

The fourth theme, "Systematic critical care nursing education," emphasizes the need for a phased and systematic approach to training for nursing students, new ICU nurses, and experienced ICU nurses. Collaborative efforts between educational institutions and clinical practice settings should be made to establish a standardized curriculum that reflects the minimum competencies required [11]. In Korea, only 22.7% of baccalaureate nursing programs offer critical care courses, primarily electives [11], leaving only a small proportion of students with formal education in this field. This indicates that only a small proportion of nursing students receive proper critical care nursing education before graduation. Critically ill patients are treated in various healthcare settings [47], and some beds in general wards are designated as "quasi-intensive care unit" beds for patients requiring intensive care but not severe enough for ICU admission [48]. Despite having the second-largest number of hospital beds, South Korea is experiencing a shortage of ICUs and skilled nurses

to care for critically ill patients [49]. There is an urgent need for a systematic approach to critical care nursing education, starting at the baccalaureate level, to effectively manage complex care situations. Our findings indicate that experienced nurses are better suited to ICU roles than new nurses. When new nurses need to be assigned to the ICU, hospitals should implement tailored training programs based on their career stage, experience, and specific needs. The COVID-19 pandemic has underlined the urgency for new nurses to be prepared for critical care immediately after graduation [50]. Consequently, educational institutions and hospitals must strategically train critical care nurses and equip general ward nurses with essential skills for handling critical cases during emergencies or infectious disease crises.

This study has several limitations. First, the small sample size from the three Korean hospitals may limit generalizability. In addition, the group members' differences in critical care experience resulted in various thoughts and opinions about critical care nursing education. Still, they limited the ability to explore each opinion in depth. Future research should organize focus groups by experience to further explore the educational needs of groups with the same amount of experience, for example, nurses with less than one year of experience, nurses with 1-3 years of experience, nurses with 3-5 years of experience, and nurses with more than five years of experience. Second, the ongoing COVID-19 pandemic during the interviews (April–May 2022) may have influenced participants' perspectives. Third, conducting interviews and data analyses may have involved some biases and subjectivity despite efforts to minimize them. Fourth, the interviews were conducted via video conference, which may have restricted the interactivity of the focus groups compared to face-to-face interviews. Future research should address this issue through face-to-face interviews.

V. CONCLUSION

Our study explored the educational needs of critical care nurses in ICUs by delineating four key themes: holistic nursing competency, advanced practical education, communication competency, and systematic critical care nursing education. The results emphasize the need to prioritize the development of essential competencies, including fundamental nursing skills and holistic care, and underscore the need for tailored, systematic, and progressive programs for various nursing professionals. These guidelines enhance critical care nursing education and advance specialized nursing expertise.

Considering the study findings, we propose several recommendations to improve critical care nursing education and practices for nursing students. First, future research should replicate the present study in various critical care nursing settings and large hospitals to increase the generalizability of the findings. Additionally, it is crucial to determine the needs in critical care nursing education content for nursing students that arise in typical critical care settings instead of solely focusing on exceptional circumstances such as COVID-19. Furthermore, schools and hospitals should collaborate to develop and implement simulation-based learning experiences to achieve holistic nursing competencies, communication skills, and basic practical skills to enhance the quality of critical care nursing education. At the policy and administrative levels, resources should be allocated to support developing and implementing systematic critical care nursing education programs. Standards and guidelines for critical care nursing education and practice should be

established by promoting collaboration between nursing schools and hospitals. Furthermore, nursing students should be provided with more practical experience in critical care units to foster their preparation for future roles as critical care nurses. By implementing these recommendations, nursing students can receive a more comprehensive and relevant critical care nursing education. This will ultimately improve patient care and increase job satisfaction among future ICU nurses.

Conflict of interest

The authors declare no conflict of interest.

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