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RESEARCH ARTICLE OPEN ACCESS

Educational Content Focusing on Basic Skills for Novice Nurses to Work Independently in Intensive Care Units in Japan: A Qualitative Study

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Abstract:

Introduction/Objectives: In Japan, novice nurses are assigned to intensive care units immediately after graduation and are expected to become independent within about a year. Therefore, in addition to long-term, comprehensive educational programs, establishing an educational system that allows novice nurses to learn intensive care unit nursing while working is necessary. This study explored senior nurses' expectations for novice nurses working independently in the intensive care unit after one year and identified the foundational skills needed for novice nurses to achieve this independence.

Methods: The research collaborators were eight senior nurses working in the intensive care unit of an acute care hospital. They were recruited from four facilities and had five or more years of clinical experience. The study used semi-structured interviews to generate data about the reports, contacts, and consultations they would expect from novice nurses to determine their readiness to become independent.

Results: This study clarified the circumstances under which novice nurses with no practical experience should voluntarily seek support to work as independent nurses one year after being assigned to an intensive care unit. It reflects the characteristics of patients who require intensive management, such as "assistance with central line insertion and removal" and "evaluation of vital signs," as well as other advanced procedures.

Conclusion: This study clarified the basic skills required for novice nurses and identified the areas in which they should seek support. In the future, this method may be utilized in the early stages of novice nurse education.

Keywords: Clinical site, Education, Focalization, Intensive care nurse, New nurse, Novice nurse.

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1. INTRODUCTION

Since intensive care units (ICUs) house critically ill patients, ICU nurses should not only be familiar with advanced techniques but also possess knowledge of complex pathological conditions [1, 2]. ICUs require skilled nurses [3, 4]. For this reason, various educational programs have been established in different countries, including the American Association of Critical-Care Nurses (AACN) [5] and a ladder system for ICU nurses in Japan [6]. Based on the AACN, the basic framework comprises: (1) assessment of critically ill patients and their families; (2) planning care for critically ill patients and their families; (3) interpretation and management of basic cardiac rhythms; (4) hemodynamic monitoring; (5) airway

and ventilatory management; (6) pain, sedation, and neuromuscular blockade management; (7) pharmacology; and (8) ethical and legal considerations [5]. The Australian College of Critical Care Nurses (ACCCN) recommends that appropriately qualified nurses should practice ICU nursing, emphasizing the need to provide specific education for nurses at all levels [7]. Although it varies by country, various organizations in Europe also support specialized training for ICU nurses. Improving the expertise of emergency medical care and efforts to train ICU nurses are needed so that they can care for seriously ill patients [8]. The contents of each country's educational program include items related to the knowledge and skills used in ICUs. The effects of education, such as improved knowledge, are revealed through the program [9-11]. As such, there are many programs available to help prepare nurses to work in ICUs. Conversely, in Japan, the only national qualification is "nurse," so new graduate nurses (novice nurses) are assigned to the ICU department, which requires advanced knowledge and skills. In Japan, each facility develops its educational program and offers training in stages based on protocols. However, there are no uniform criteria for becoming independent, leading to significant differences in the time it takes novice nurses to reach a certain level. Therefore, in practice, it is the head nurse who decides. Consequently, novice nurses must be trained to work independently in the ICU within a year.

However, existing programs that cover all knowledge and skills are too comprehensive to serve as a standard for novice nurse independence. Previous research on educational programs that promote independence through early practice is scarce in Japan. Therefore, to develop an educational program suited to clinical settings in Japan, we conducted in-depth interviews with senior nurses about the behaviors they expect from novice nurses in actual clinical settings. In particular, there is no content focused on achieving independence within one year. ICU orientation increases cognitive load [12] and therefore, training novice nurses should prioritize essential content [13]. In other words, when designing training content for novice nurses in clinical settings, it is necessary to clearly define the essential skills of a long-term, comprehensive educational program. Therefore, this study aimed to identify the basic skills required for novice nurses to be considered independent by consolidating specific examples of reports, contacts, and consultations that senior nurses in the ICU expect from them. We report our findings on the content of novice nurse in-service education in Japan, specifically for ICUs.

2. MATERIALS AND METHODS

2.1. Research Design

This study employed a qualitative design, using semi-structured interviews to collect data.

2.2. Sample

The sample comprised nurses working in the ICU of an acute hospital with over 500 beds. Their consent was obtained through a request for interviews conveyed by an acquaintance of the researchers. The study participants were eight nurses from four facilities with five or more years of clinical experience who provided guidance to novice nurses in their daily practice.

2.3. Data Collection

The study was conducted between February and July 2019. The date, time, and location of the interviews were communicated to the nurses. The purpose of the study was explained verbally and in writing, and consent forms were obtained. Following the interview guide, we asked the senior nurses about the reports, contacts, and consultations they would like novice nurses to refer to and engage with to determine whether they are capable of working independently. The interview started with the question, "What types of reports, contacts, and consultations do you expect from novice nurses?" We also inquired, "Can you describe the reports, contacts, or consultations you were expecting but did not receive from novice nurses?" Following this, we continued the interview by evaluating the comments regarding the independence of novice nurses. Regarding abstract narratives, we focused on concrete examples. These semi-structured interviews lasted approximately 1 hour and were recorded using a voice recorder, along with notes taken on paper.

2.4. Data Analysis

The recorded data were coded so that individuals could not be identified, and a verbatim transcript was created. After repeatedly reading the transcripts to gain an overall understanding of the narrative, we extracted observations and actions that were clearly treatment-related in the reports, contacts, and consultations required of novice nurses. We discussed the results and extracted pertinent categories. Multiple researchers with clinical experience conducted the selection and sorting to ensure authenticity. We examined the validity of our categories using the Critical Care Nursing Course-a program for imparting the knowledge and skills necessary for nurses assigned to ICUs [14].

2.5. Ethics Approval

This study was conducted with approval from the Ethical Review Board of Osaka University Hospital (approval number: 18335). We explained to the research collaborators the purpose of the research, the research method, and the voluntary nature of participation, assuring them that they would not be penalized if they did not participate. The collaborators were assured that although the data may be publicized for research purposes, their personal information will be protected. This was explained both in writing and verbally, and consent was obtained.

3. RESULTS

The research collaborators were two men and six women from four facilities. Their mean (standard deviation) age, years of experience, and years of ICU experience were 32.4 (8.1), 10.8 (8.5), and 7.5 (3.3) years, respectively (Table **1**).

This study identified the basic skills that novice nurses without prior nursing experience should possess at the beginning of their careers. It outlined the actions necessary for novice nurses to function effectively as independent staff members before acquiring knowledge and skills. It emphasizes the importance of seeking support from senior nurses to perform their duties independently once assigned to the ICU. We extracted detailed scenarios by listening to specific examples of reports, contacts, and consultations required by senior nurses for novice nurses to work independently and be considered part of the workforce in an ICU. These matched the items listed in the Critical Care Nursing Training Skills of the Critical Care Nursing Course [14] (Table **2**), revealing the following results. Since this educational program aligns with our research, we have outlined, using double quotation marks, the specific examples of reports, contacts, and consultations that senior nurses need to provide to novice nurses in order for them to work independently and be fully integrated into the ICU team.

Table 1. Characteristics of the research collaborators interviewed.

Collaborator	Sex	Age (years)	Years of Nursing Experience (n^{th} year)	Years Worked in ICU (n^{th} year)
A	Male	27	5	5
B	Female	27	5	5
C	Female	27	6	6
D	Female	31	11	4
E	Female	32	11	11
F	Male	33	11	11
G	Female	29	5	5
H	Female	53	32	13

Table 2. Educational content pertaining to basic skills for novice nurses to work independently in ICUs.

Agreed Categories	Detailed scenarios of specific examples of reports, contacts, and consultations required by senior nurses for novice nurses to work as sole nursing staff in an ICU
Central line care	Assistance with central line insertion and removal
Invasive neuro intervention care	Assistance with spinal drain removal
	Changes in pupil diameter and level of consciousness
Respiratory care and assessment	Suction
	Evaluation for suction of bloody secretions
Assessment of critical care patients	Evaluation of vital signs
	Urine volume management
	Evaluation of water balance
	Discovery of dangerous electrocardiogram waveforms
	Management when using an external pacemaker
	Blood gas analysis test results
	Management of patients with stoma
	Assistance with drain insertion/removal
	Wound and drain management
	Replacement of low pressure drainage bag
	Response to alarms
	Accepting postoperative patients
	Care and treatment upon admission to ICU
	Insulin administration according to the nutritional management method
	Management after organ transplant
	Raising nursing issues
	End-of-life prediction
	Visiting and sharing family information
Hemodynamic line care	Assistance with arterial line insertion/removal
	Management of catecholamine dosage
	Replacing the catecholamine syringe
	Increase in catecholamines
	Parallel update of catecholamines when replacing central line

(Table 2) contd.....

Agreed Categories	Detailed scenarios of specific examples of reports, contacts, and consultations required by senior nurses for novice nurses to work as sole nursing staff in an ICU
Pain management and sedation assessment	Pain management
	Richmond Agitation-Sedation Scale (RASS) evaluation
	Management of patients receiving sedatives
	Restraint and management of patients under restraint
	Identification of the onset and management of delirium symptoms
	Assistance for restless patients
	Management of dementia patients
Ventilator training	Report and contact of extubation schedule
	Management of patients on ventilators (including leaks, settings, and weaning)
	Evaluation of whether extubation is possible
	Extubation assistance
Others	Complete bed bath
	Handling of drugs other than catecholamines
	Correct way to double check
	Coordination during break shifts
	Cooperation during busy times

Central line care includes “assistance with central line insertion and removal.” Central line insertion in the ICU is often an emergency requirement due to the patient's condition. This also reflects the significant responsibility of managing several drugs that need to be administered through the central line.

Invasive neuro-intervention care includes “assistance with spinal drain removal” and “changes in pupil diameter and level of consciousness.” This reflects the need to accommodate patients with diseases of the cranial nervous system and provide nursing care for those with pathological conditions that require observation for neurological symptoms.

Respiratory care and assessment include “suction” and “evaluation for suction of bloody secretions.” This reflects the need to monitor aspirated secretions during ventilator care as a part of systemic management after major surgery and when accommodating patients who require airway management due to severe respiratory disease or failure.

Assessment of critical care patients includes “evaluation of vital signs,” “urine volume management,” “evaluation of water balance,” “discovery of dangerous electrocardiogram waveforms,” and several other scenarios. Although assessing a patient's medical condition and need for nursing care may be an advanced skill for novice nurses who have just joined the workforce, it is an essential skill for ICU nurses.

Hemodynamic line care includes “assistance with arterial line insertion/removal,” “management of catecholamine dosage,” “replacing the catecholamine syringe,” and other such scenarios. Although catecholamines are associated with central line care, they are classified here because they are drugs related to hemodynamics. As circulatory agonists, they have the potential to be life-threatening. Thus, special care must be taken and safe techniques must be followed to avoid adverse effects when renewing or increasing the dose.

Pain management and sedation assessment include “pain management,” “Richmond Agitation-Sedation Scale (RASS) evaluation,” “management of patients receiving sedatives,” and so forth. Patients admitted to the ICU often require pain management and sedation and are more likely to develop delirium due to the effects of their general condition and medications.

Ventilator training includes “report and contact of extubation schedule,” “management of patients on ventilators (including leaks, settings, and weaning),” “evaluation of whether extubation is possible,” and “extubation assistance.” This means that extensive ventilator management is required in ICUs.

In addition, although they could not be classified as Critical Care Nursing Training Skills, some essential items, such as “complete bed bath,” “handling of drugs other than catecholamines,” and “correct way to double check,” among others, were also extracted. This indicates that even nursing care and procedures that are performed in general wards require careful consideration when performed on critically ill patients. The collaborators also emphasized the importance of information sharing when working in a team through items such as “coordination during break shifts” and “cooperation during busy times.”

4. DISCUSSION

ICU nurses require advanced knowledge and skills. However, in Japan, novice nurses are assigned to ICUs under the guidance of senior nurses despite the lack of preparation for practice and knowledge specific to emergency medicine [15]. For such novice nurses, imparting education on the spot while working, in parallel with the extensive existing educational programs, is essential. By conducting interviews with senior nurses about the reports, contacts, and consultations necessary for novice nurses to become independent, we clarified the practical educational content for novice nurses aiming to become independent. Furthermore, the validity of the results was evaluated, as they matched the items listed in the Critical Care Nursing Training Skills of the Critical Care Nursing Course. However, many educational

programs already exist to acquire knowledge and skills, and the item itself is not a new report. In other words, this study aimed to identify the behaviors necessary for novice nurses who have not yet gained all knowledge and skills to function independently in the workforce. Previous programs focused on teaching ICU nurses the required skills but did not establish criteria for independence. Senior nurses are aware that novice nurses' knowledge and skills are immature; hence, senior nurses expect them to ask for help when needed and learn the required knowledge and skills. This helps novice nurses earn trust, which is a significant factor in working independently from senior nurses. In other words, these are skills that novice nurses must be able to perform, even with assistance, from the beginning of their assignment to be recognized as independent nurses. It is significant that we were able to identify these skills through interviews with senior nurses in the field.

For novice nurses to provide nursing care based on accurate knowledge and safe techniques, we focused on the aspects that senior nurses who provide daily guidance should first teach novice nurses in their practice.

The skills that novice nurses should acquire in the early stages include assisting with procedures related to lines and ventilator management, reflected in each category of "assistance with central line insertion and removal," "assistance with spinal drain removal," "assistance with drain insertion/removal," "assistance with arterial line insertion/removal," and "extubation assistance." Since these represent the characteristics of patients who require ICU management and the advanced procedures performed in the ICU, the content is advanced for novice nurses and requires time to acquire relevant knowledge and skills. Therefore, support from senior nurses is essential before novice nurses can perform the procedure completely on their own. A novice nurse may lack awareness of procedures that a seasoned senior nurse would consider routine practice, including necessary precautions and potential future implications. Bedside training is essential to identify the deterioration of clinical symptoms [16, 17]. Therefore, senior nurses should provide initial guidance, allowing novice nurses to acquire skills through training [18]. For this reason, senior nurses believe that it is necessary for novice nurses to seek support independently. If novice nurses can do this, they will be able to become independent without being monitored by senior nurses.

Given that high-risk drugs are often used in ICUs, knowledge of drugs is also necessary [19]. Catecholamines are especially important among drugs used in ICUs. Because they are life-threatening drugs, they must be handled with care to ensure that their administration does not alter the patient's hemodynamics [20]. Senior nurses need to make novice nurses aware that handling high-risk drugs as they would any other regular drugs can put patients at risk. Therefore, in this study, senior nurses specifically used catecholamines as an example to explain the importance of medication management in the ICU.

The severity of the condition of patients admitted to the ICU and the urgency of treatment were high, as expressed in the content regarding nursing care and evaluation. Patients admitted to the ICU could face life-threatening danger if certain aspects of nursing care are overlooked. However, it takes time for novice nurses to notice abnormalities, assess them, and manage them on their own. Novice nurses need support from experienced nurses for complex patient situations that require several skills [21]. By first communicating with senior nurses, novice nurses can learn the aspects of nursing that require additional care and their corresponding expectations, thereby accumulating knowledge and experience that will help them become independent in the future. Communication is important not only for developing novice nurses' professional behavior but also for gaining knowledge from senior nurses [22, 23]. Effective teams and support staff are essential for novice nurses to develop as human resources [24, 25]. Factors such as the gap between theory and practice, experience, and a lack of knowledge can reduce novice nurses' confidence [26]. Young nurses are highly dependent on senior nurses with extensive work experience, consulting them and seeking advice to confirm clinical deterioration when they have doubts or lack ability [16]. Novice nurses should thus build relationships with senior nurses through which they can easily share information and collaborate.

Furthermore, patients admitted to the ICU often communicate poorly due to their critical condition and sedation. Protecting patient safety in such an environment is one of the roles of ICU nurses [27]. However, the ICU is perceived as a high-risk environment and is considered frightening by novice nurses [12]. Our interviewees explained about detecting abnormalities and the progression of treatment to save patients' lives. To be able to do this, the knowledge and skills of nurses included in each educational program are important. The ultimate goal is for novice nurses to acquire the necessary knowledge and skills. However, before that, they must begin working as part of the workforce, where they should not hesitate to seek help and become independent in areas where they lack experience. In addition, nurses must work together as members of an organization, as effective teamwork improves performance and the quality and safety of care [28]. We believe that fostering nurses who are aware of and can implement this work approach will enhance the demand for and availability of skilled nurses [3].

In this study, we interviewed senior nurses in clinical settings who actually provide daily guidance to novice nurses. Therefore, differing from existing programs that are rich in theoretical content, we were able to highlight cases that occur more frequently in clinical settings. For novice nurses to be able to perform these tasks on their own, learning and experience are required, which take time. However, in reality, novice nurses are assigned to ICUs and provide nursing care immediately after graduation, limiting their ability to become independent immediately. Thus, specific education tailored to the needs of clinical sites should be imparted simultaneously as nurses join the medical workforce. It has been suggested that to facilitate a smooth transition to clinical practice, orientation programs

should be provided that allow for a gradual deployment of skills [29, 30]. We also need to consider the extent to which novice nurses need to be able to perform tasks to be considered independent. We hope that, based on these results, an educational program that is effective in practice can be developed. Furthermore, training preceptors have been shown to help novice nurses develop their clinical skills [31, 32]. We hope the study findings underscore the role of senior ICU nurses in imparting highly specialized education to novice nurses and emphasize the importance of the role of ICU nurses.

4.1. Strengths and Limitations

This study has a limitation. Sampling bias may have emphasized the perspectives of nurses with specific attributes or experiences and, therefore, may not reflect the opinions of all ICU nurses in Japan. However, although previous programs were logically created by specialists and contained a wealth of content, in this study, questions were asked of senior nurses in clinical settings, allowing us to extract information in a realistic and concise manner. In the future, it will be necessary to conduct research focusing on the perspectives of novice nurses. The framework is comprehensive and consistent with those of previous programs. However, it needs to be refined step by step.

Because this research was able to reify certain content, it is likely that it will be used as basic material for training novice nurses. However, in Japan, there is a possibility that experienced nurses who do not wish to be transferred to the ICU may become ICU nurses. We believe that focusing on the educational content may benefit even experienced nurses.

CONCLUSION

In this study, we interviewed senior nurses about specific examples of reports, contacts, and consultations they expect from novice nurses to work independently in the ICU. Our findings-confirmed the basic skills that senior nurses believed would enable novice nurses to achieve independence while ensuring patient safety through appropriate support-seeking from senior nurses. Furthermore, although previous studies have demonstrated the effectiveness of educational programs, this study focused on clarifying the basic skills that support the independence of novice nurses, which have not been previously examined. In the ICU, where advanced knowledge and skills are required, we believe that providing focused and targeted education will expedite novice nurses' transition to independence. This study also highlights the critical role of ICU nurses. We believe that these results may be useful in the initial education of novice nurses in the future.

AUTHORS' CONTRIBUTION

S.I conceptualization, data curation, formal analysis and writing original draft. T.T and T.I conceptualization, data curation, formal analysis, and writing review and editing. M.F, Y.T and M.N data curation, formal analysis, and writing review and editing. All authors approved the final draft.

LIST OF ABBREVIATIONS

AACN	=	American Association of Critical-Care Nurses
ACCCN	=	Australian College of Critical Care Nurses
ICUs	=	Intensive care units
RASS	=	Richmond Agitation-Sedation Scale

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was conducted with approval from the Ethical Review Board of Osaka University Hospital, Japan (approval number: 18335). We explained to the research collaborators the purpose of the research, the research method, and the voluntary nature of participation, assuring them that they would not be penalized if they did not participate. The collaborators were assured that although the data may be publicized for research purposes, their personal information will be protected. This was explained both in writing and verbally, and consent was obtained.

HUMAN AND ANIMAL RIGHTS

All human research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013.

CONSENT FOR PUBLICATION

Informed consent was obtained from all participants.

STANDARDS OF REPORTING

COREQ guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data that support the findings of this study are available from the corresponding author, [S.I] on special request.

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None.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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