

Clinical Competencies of Newly Nurses in the Intensive Care Unit: A Scoping Review Study

Hossein Ghasemi¹, Alireza Irajpour², Somayeh Azimpour^{*3}

1. *PhD student in Nursing, Student Research Committee, School of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran*
2. *Professor, Critical Care Nursing Dept., nursing and midwifery care research center, faculty of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran*
3. *PhD student in Nursing, Student Research Committee, School of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran*

Abstract

Introduction: Providing care for patients in intensive care units requires a skilled and qualified nursing workforce equipped with up-to-date knowledge, awareness, and expertise. Therefore, this study aimed to determine the clinical competencies of newly graduated nurses in intensive care units in Iran.

Methods: In this narrative review study, using the keywords "Clinical competence", "Intensive care unit", "Nurse", "preorientation", "critical care", "competence", "prepare", "intensive care unit", "newly qualified nurses", "novice nurse", "ICU" studies published in Persian or English with full text from 2012 to 2024 were searched in the following databases: SID, MAGIRAN, PUBMED, SCOPUS, and Web of Science. Articles that were not aligned with the research objective were excluded from the study. Out of the 117 articles searched, a total of 30 relevant articles were ultimately selected.

Results: The results of the analyses indicate that clinical skills, managerial abilities, theoretical knowledge, clinical decision-making, critical thinking, problem-solving skills, communication skills, time management, readiness, and emotional intelligence are among the most important clinical competencies for newly graduated nurses entering intensive care units.

Conclusion: Given the significance of delivering high-quality care in intensive care settings and the impact of such care on patient outcomes, it is essential to provide training for novice nurses in this field to acquire the necessary clinical competencies.

Keywords: Clinical competence, newly nurses, intensive care unit, Scoping Review

Introduction

The intensive care unit (ICU) is responsible for the care of patients in critical conditions, utilizing advanced and specialized facilities. These patients typically include individuals facing respiratory issues, complex surgeries, accidents, and other acute medical situations (1). Scientific and technological advancements have transformed this unit into a specialized field, creating a complex and often high-pressure work environment (2). Critical conditions,

clinical instability, the necessity for monitoring, ethical dilemmas in patient care, a high-pressure environment, numerous interventions, and the potential for adverse effects and mortality complicate the care of patients in this department. (3, 4). The complexity of care makes this area prone to errors and adverse events. (5, 6). It is estimated that by 2030, the demand for specialized and critical care will increase by 25%, highlighting the importance of addressing the existing challenges in this sector (7).

Caring for patients in intensive care units requires a skilled nursing workforce equipped with advanced competencies such as critical thinking, problem-solving abilities, leadership and judgment skills, evidence-based nursing care, independence, and the capacity to balance the scientific, functional, and humanistic components of nursing care. Additionally, it necessitates rapid decision-making and proficiency in advanced technologies(8). Nurses in this field must possess not only extensive scientific knowledge but also the ability to operate equipment such as ventilators, dialysis machines, and various types of monitors. These skills enable nurses to provide high-quality care in high-pressure and complex situations. Additionally, one of the key factors that distinguishes intensive care unit nurses from other nursing professionals is their need for a deep understanding of both theoretical and practical nursing concepts, allowing them to effectively meet their patients' needs(9). Considering the specific conditions outlined in this section, the development of specialized competencies is essential. Insufficient competencies can lead to negative consequences, such as an increase in medical errors, prolonged patient hospitalization, and a decline in patient safety and health(10).

Various definitions of competence exist; however, it generally refers to a combination of knowledge, skills, and professional judgment necessary for effective performance in clinical settings(11). In a study, the essential competencies required for critical care nurses include leadership, problem-solving, clinical judgment, quality management, and effective communication skills. These competencies play a crucial role in ensuring the quality of services and minimizing complications(12). At the same time, ongoing and structured training is essential for the development of these competencies. However, there is currently no internationally agreed-upon set of competencies for nurses in intensive care units to receive advanced training. Furthermore, these competencies are significantly influenced by socio-cultural factors related to healthcare(13).

Razavi and colleagues, citing Li and Chang in their 2022 study, indicated that nursing encompasses four distinct levels of professional competence. They emphasized that nurses working in intensive care units must possess the highest level of nursing proficiency, as the quality of care is directly influenced by their skills. Research demonstrates a direct correlation between a nurse's competence and patient clinical outcomes(14). A study conducted by Gando in 2019 indicated that a lack of competence among intensive care nurses has resulted in suboptimal care for critically ill patients and their families(15). In addition, Baroness states in her 2017 study that competency gaps are exacerbated by the annual turnover of nurses across various hospital departments, resulting in a loss of expertise and qualifications in the intensive care unit(16). In this context, nursing staff working in these areas must undergo extensive theoretical and practical training to effectively respond in critical situations(17). Critical care nursing is an increasingly complex field that requires specialized skills. However, access to high-quality specialized training remains a significant issue in critical care nursing(18).

The shortage of trained nurses and the lack of specialized training programs in many countries, including Iran, represent a significant challenge in this field. Unlike developed nations that offer structured critical care training for nurses post-graduation, nurses in developing countries often enter critical care settings without specialized education. As a result, the absence of specialized programs in these countries forces nurses to rely solely on basic nursing training, which is insufficient for optimal performance in these critical areas(19). For instance In countries such as Iran and Japan, newly graduated nurses often enter the workforce without completing specialized training programs(20, 21), This situation not only poses significant risks to patient safety but also increases stress levels among nurses and diminishes the quality of care provided. Addressing these challenges necessitates a focused approach to the specialized education of nurses and the establishment of competency standards(22).

Considering the findings from various studies on the necessity of training competencies in the intensive care unit to enhance service delivery, along with the significance of providing high-quality care in this area, it has become evident through the experiences of researchers, particularly those who have worked as intensive care nurses and observed the lack of training for new nurses and its impact on patient outcomes, that there is a pressing need to establish the expected competencies for nurses in the intensive care unit. It is hoped that the present review of the field will serve as a significant step towards establishing the competencies of newly admitted nurses in the intensive care unit, ultimately leading to improved patient outcomes.

Methods

This study presents a scoping review of research conducted in both Persian and English scientific journals, published between 2014 and 2024. To identify relevant studies, databases such as SID, Magiran, PubMed, Scopus, and Web of Sciences were utilized. The search employed keywords including "Clinical competence," "Intensive care unit," "Nurse," "preorientation," "critical care," "competence," "prepare," "intensive care unit," "newly qualified nurses," "novice nurse," and "icu."

The keywords utilized were selected based on the Mesh terminology. The primary author (S.A) searched for studies, and to ensure the inclusion of relevant and appropriate research, the studies extracted by other researchers (A.I and H.GH) were independently reviewed. Out of the 117 initial articles identified in the databases, 31 articles that met the inclusion criteria were selected for further examination of their findings. The process of selecting articles is illustrated in Figure 1.

The criteria for inclusion in this study are as follows: 1. The study must focus on the competencies of nurses in the intensive care unit. 2. Articles published in either Persian or English with full text, released between 2014 and 2024, are required. 3. Keywords or their equivalents must be present in the title or abstract of the article. Criteria for study exclusion included articles that were not aligned with the study's objectives, as well as studies for which the full text was not accessible. Additionally, any articles published as letters to the editor, presented at conferences, or found in the Ministry of Health's blacklist journals were also excluded from the study. This study extracted information regarding researchers, publication years, study locations, research populations, types of interventions, and their outcomes. Due to the heterogeneity of the studies examined, a synthesis of their results was avoided. Data analysis was conducted through a comprehensive review of the articles, qualitative aggregation, and conclusions. After applying the inclusion and exclusion criteria, the text of all retrieved articles was read multiple times by the first author and reviewed by the second and third authors to gain a deeper understanding of the studies. Data were extracted based on the article title, lead author's name, year of publication, study population, methodology, and study results. The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines were utilized to assess the quality of the articles, specifically for the evaluation of systematic review studies.

Articles found in databases
(N= 117)

Identification

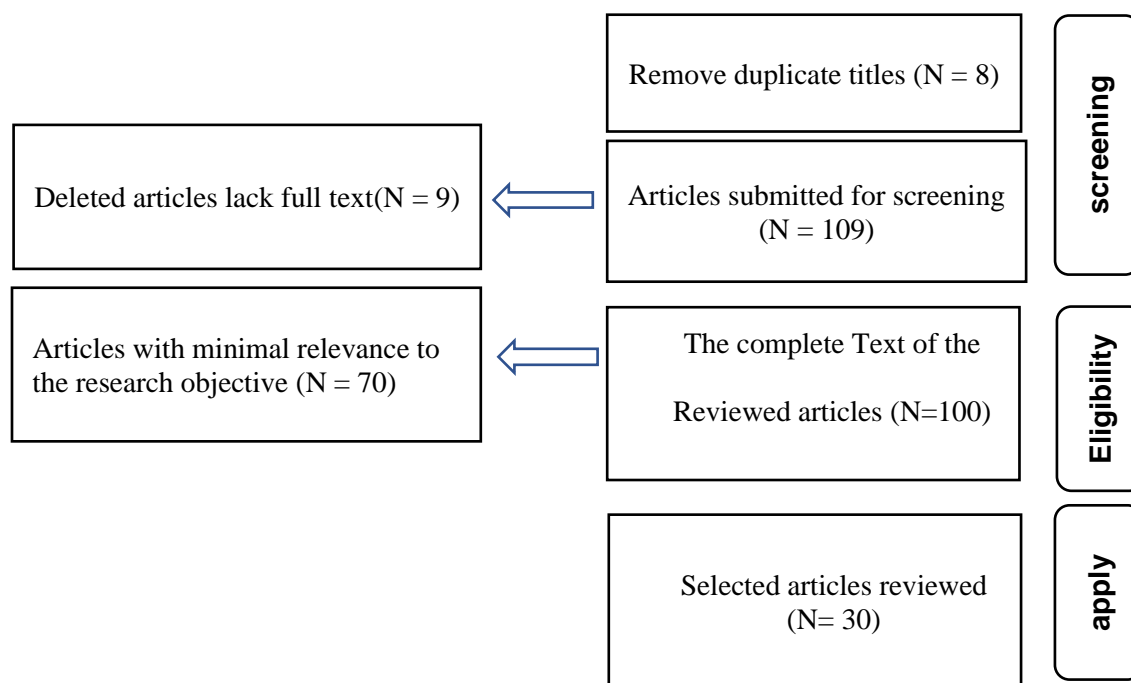


Figure 1: The trend of article review and the text evaluation process

Results

In this study, 30 articles related to the competencies of nurses in intensive care units were selected and their results were discussed. The reviewed papers were published in English. Out of the 30 studies included, 4 were conducted between 2012 and 2016, 12 from 2017 to 2020, and 14 from 2021 to 2024. In terms of study type, there were 13 intervention studies, 7 review studies, 6 qualitative studies, and 3 descriptive studies. The results of these studies are presented in Table 1. Based on the reviewed articles, the qualifications of intensive care unit nurses were associated with factors such as clinical skills, management abilities, theoretical knowledge, clinical decision-making, critical thinking, problem-solving, communication skills, time management, preparedness, and emotional intelligence.

Table 1. Summary of Study Results

The essential competencies of novice nurses in the intensive care unit, derived from the article	Type of Study	Year	Author	Article Title
Professional competencies combined with compassion, focused on professional development, and skills in patient support and supervision.	Intervention Study	2023	Emma Blackmon	Improving Staffing in the ICU with New Graduate Nurses: A Novel Critical Care Fellowship Program(23)
Skills in assessing bodily systems, evidence-based decision-making, the ability to make decisions in variable and complex situations, problem-solving, critical thinking, procedural skills, communication skills, and workload management.	Delphi study	2022	Ruth Endacot	Development of competencies for advanced nursing practice in intensive care units across Europe: A modified e Delphi study(11)
Social relationship development skills.	Exploratory qualitative case study	2021	Carolynne Stewart	Understanding new nurses' learning experiences in intensive care(24)
Foundational knowledge of intensive care, ongoing continuous education, proficiency in documenting provided care, and effective communication skills.	Descriptive study	2022	Suveksha Giri	Readiness to care and factors influencing readiness to care for patients in the intensive care units among novice nurses(25)
Awareness of policies, roles, scope of work, and skills.	scoping review	2021	Ingrid Egerod	Skills, competencies, and policies for advanced practice critical care nursing in Europe: A scoping review(12)
The ability to manage anxiety and stress, along with timely decision-making, fostering relationships with colleagues and peers, emotional intelligence, and providing emotional support.	systematic review	2020	Charlotte E Elias	Experiences of Newly Qualified Nurses in Critical Care: A qualitative systematic review(26)
Appropriate knowledge, skills, and expertise in the field of patient care within the intensive care unit.	Descriptive study	2015	Ruth Endacott	The state of critical care nursing education in Europe: an international survey(27)
Management knowledge and skills, practical abilities, and interpersonal skills with colleagues, patients, and patient companions.	Intervention Study	2020	Li TONG	Assessment of Novice Learners in a Novel High-Fidelity Simulation-Based Extracorporeal Membrane Oxygenation Education Program(28)
Leadership, interpersonal relationships, ethical and legal performance, professional	Intervention Study	2019	Azita Monshizade	The Effect of Nursing Residency Program on the

The essential competencies of novice nurses in the intensive care unit, derived from the article	Type of Study	Year	Author	Article Title
development, teaching and education, and a propensity for research and critical thinking.				Clinical Competency of Novice Nurses Working in the ICU & NICU from the Viewpoint of Head Nurses(29)
Professional development skills, foundational knowledge, practical skills, diagnostic studies, mechanical ventilation, management of complex diseases, end-of-life care, patient safety, and pharmacology.	review	2018	R. Scott Kopf	A Competency-Based Curriculum for Critical Care Nurse Practitioners' Transition to Practice(30)
The approach to monitoring and supporting patients in the intensive care unit.	Quasi-Experimental Study	2023	Monshizadeh A	The Effect of Multidimensional Orientation Program on the Clinical Competence of Beginner Nurses Working in Intensive Care Units: A quasi-experimental Study(31)
Specialized training in intensive care, interprofessional teamwork, and management of increased workload.	Qualitative Study	2022	Jinxia Jiang	Knowledge, Attitude, and Perceived Barriers of Newly Graduated Registered Nurses Undergoing Standardized Training in Intensive Care Unit Toward Early Mobilization of Mechanically Ventilated Patients: A Qualitative Study in Shanghai(32)
Therapeutic communication skills, and advanced training in pain management.	Intervention Study	2022	Courtney Smith	Utilizing Simulation with the Novice ICU Nurse for Withdrawal of Life Support(33)
Knowledge, attitude, and skills related to pain management, restlessness, delirium, immobility, and sleep disorders in intensive care unit patients.	Intervention Study	2022	Szu-Ying Lee	The Effects of Pain, Agitation, Delirium, Immobility, and Sleep Disruption Education on Novice Nurses in Adult Intensive Care Units(34)
Familiarization of graduate nurses with equipment and the use of technologies in patient care.	Intervention Study	2020	Aiza Quinday	Implementing Simulation in ICU New Graduate Nursing Orientation: Introducing Two Practice Innovations Orientation: Introducing(35)
Knowledge about the principles of using and operating artificial ventilation devices.	Descriptive study	2014	Copede Guilhermino	Education of ICU nurses regarding invasive mechanical ventilation:

The essential competencies of novice nurses in the intensive care unit, derived from the article	Type of Study	Year	Author	Article Title
				Findings from a cross-sectional survey(36)
Knowledge and high self-confidence.	Intervention Study	2017	Bryan Boling	Implementing Simulation Training for New Cardiothoracic Intensive Care Unit Nurses(37)
Acquiring qualifications for end-of-life patient care involves specialized training for the proper management of patients.	phenomenological study	2019	Y.G. Santana Padilla	Training needs detected by nurses in an intensive care unit: a phenomenological study(38)
Critical thinking skills encompass evaluation, prioritization, planning, decision-making, problem-solving, assessment, time management, and workload management.	integrative review	2018	Tiana Innes	Transition support for new graduate and novice nurses in critical care settings: An integrative review of the literature(39)
Fundamental characteristics, technical, practical, interpersonal, legal, ethical, academic, and university-related aspects, as well as problem-solving abilities and clinical reasoning skills.	integrative review	2018	Janice Gullick	Structures, processes, and outcomes of specialist critical care nurse education: An integrative review(18)
Clinical decision-making, care, support, and ethical principles, evidence-based practice, collaborative and management skills, and the ability to facilitate self-development training.	systematic review	2023	Hideaki Sakuramoto	Clinical practice competencies for standard critical care nursing: consensus statement based on a systematic review and Delphi survey(13)
Communication skills, emotional intelligence, and innovation	scoping review	2022	Andrea Iraizoz	Nurses' clinical leadership in the intensive care unit: A scoping review(40)
Problem-solving ability.	quasi-experimental research design	2022	Zeinab Ahmed Abd El-Naby	Effect of Educational Program on Autonomous Decision Making among Novice Graduated Nurses on their Competency in Career Management(41)
Airway management skills, defibrillator operation, chest tube management, patient safety, feeding tubes, fall prevention, drainage care, sepsis management, urinary catheter placement, and central catheter care.	Intervention Study	2019	Kathleen Short	A Critical Care Skills Program to Support Newly Hired Nurses(42)

The essential competencies of novice nurses in the intensive care unit, derived from the article	Type of Study	Year	Author	Article Title
Stress management, self-confidence, clinical judgment, and critical thinking skills.	Intervention Study	2020	Kelsey Murphy	New Graduate Nurses Experiences During Their Transition from Novice to Competent and How Mentorship Post Residency Affects Their Experiences(43)
Knowledge and information, along with the practical skills to apply that knowledge when interacting with patients in the intensive care unit.	Qualitative Study	2019	Rodwell Gundo	Contextual issues that influence preparedness of nurses for critical care nursing practice in Malawi(15)
Collaboration, teamwork, professional confidence, knowledge, and its practical application.	Qualitative Study	2022	Lena Serafin	Novice nurses' readiness to practice in an ICU: A qualitative study(44)
Fundamental knowledge, essential skills, Basic attitudes, and values, as well as foundational experience, principles of Nursing care, clinical guidelines, nursing interventions, ethical activities, decision-making, and collaboration.	Delphi study	2012	Riitta-Liisa Lakanmaa	Competence requirements in intensive and critical care nursing — Still in need of definition? A Delphi study(45)
Confidence, critical thinking, and the enhancement of both practical and theoretical skills.	Intervention Study	2015	Shannon Johnson Bortolotto	Developing a Comprehensive Critical Care Orientation Program for Graduate Nurses(46)
Palliative care and end-of-life care skills.	Cross-Sectional Survey Study	2022	Colette D. Baudoin	New Graduate Nurses in the Intensive Care Setting. Preparing Them for Patient Death(47)

Discussion

The Intensive Care Unit is recognized as one of the most critical and complex areas of nursing. Entering this field requires a specific set of competencies and skills that newly graduated nurses must master(10). This review study examined the qualifications required for newly admitted nurses in the intensive care unit. One of the essential competencies required for newly admitted nurses in the intensive care unit is the clinical skills related to the care of patients in critical conditions. The findings of the descriptive study by Copede Guilhermino (2014) and the review study by R. Scott Kopf (2018) indicated that both basic and advanced practical skills are essential requirements for newly graduated nurses(30, 36). Skills such as airway management, mechanical ventilation, sepsis control, and care for patients nearing death have been emphasized, and skill-based educational programs, such as simulation training, have effectively enhanced the practical performance of new nurses(28, 37). These programs contribute to professional development and boost confidence(24), making them essential for training new nurses in intensive care settings. A calm and stress-free environment is deemed essential for the newly arrived nurse in the intensive care unit to facilitate

effective training(30). The lack of specialized training in intensive care, insufficient interprofessional collaboration, and excessive workload have been identified as barriers to achieving clinical competency among nurses(32).

Other competencies identified for nurses in intensive care units are clinical decision-making, critical thinking, and problem-solving. The ability to make decisions in complex and high-pressure situations is a vital skill in critical care (11), where quick and effective decision-making is essential(45). In the study conducted by Azita Monshizade and colleagues (2023), it was revealed that newly graduated nurses were perceived by their supervisors as having weak critical thinking and clinical decision-making skills. Consequently, from the supervisors' perspective, there is a need for further training in these areas. Various studies highlight the significance of educational programs in enhancing clinical judgment and problem-solving skills(13, 39).

Abd El-Naby and colleagues (2022) have demonstrated that educational programs focused on critical thinking and autonomous decision-making enhance the cognitive and professional skills of nurses(41). Innes and colleagues (2018) also demonstrated that newly arrived nurses in the intensive care unit require training in critical thinking skills, including patient assessment, prioritization, planning, decision-making in critical situations, and problem-solving(39). Zeinab Ahmed Abd El-Naby and colleagues (2022) also stated that a three-month training program focused on autonomous decision-making significantly enhances the problem-solving abilities, decision-making skills, and competencies of newly graduated nurses in the intensive care unit(41).

An additional qualification for intensive care unit nurses that holds significant importance is the ability to communicate effectively with patients, their families, and other members of the healthcare team. Communication skills are essential requirements for working in the multidisciplinary environment of the intensive care unit(11). Smith and colleagues (2022) emphasized the significance of developing therapeutic relationships, accurate reporting, and effective collaboration within teams(33). Developing social relationships and fostering positive interactions with colleagues is a key factor in the success of newly arrived nurses in a new environment(24, 26). Additionally, developing social connections with coworkers is crucial for learning, feeling comfortable, and adapting to the new setting(24). Therefore, novice nurses must possess strong communication abilities to convey necessary information during critical situations and provide families with explanations regarding patients' conditions(26). In this context, the study by Smith and colleagues (2022) identified therapeutic communication skills as the most common gap among newly admitted nurses in the intensive care unit(33). Furthermore, Monshizade and colleagues (2019) reported that the clinical competence of new nurses, as perceived by their head nurses, was weak in terms of interpersonal relationships. This indicates a need for further training in this aspect(29).

Time management and workload management are recognized as essential competencies for nurses in intensive care units. Newly graduated nurses frequently encounter challenges related to time management and high workloads. Innes et al. (2018) indicate that these novice nurses often experience anxiety regarding time management while performing tasks. They require sufficient time to develop their time management skills and suggest that if intensive care units can outline the necessary skills and knowledge for functioning in their complex environment and implement an orientation program, it would enhance the preparedness of newly graduated nurses(39). Additionally, Padilla et al. (2019) demonstrated that training programs focused on time management and task prioritization positively impact the reduction of anxiety and the improvement of performance among new nurses in intensive care settings(38).

The next essential qualification required for the intensive care unit is the training and preparation of nurses. The absence of prerequisites and a lack of educational programs for newly admitted nurses in the intensive care unit are considered weaknesses that need to be addressed and improved(38). Research has indicated that newly graduated nurses enter the intensive care unit with limited knowledge and experience, highlighting their need for ongoing and specialized training(25, 36). One of the significant challenges in nursing education across European countries is the development of a specialized training program for intensive care. This initiative aims to cultivate nurses equipped with the necessary knowledge, skills, and expertise to enhance the quality of patient care in intensive care units(27). Educational programs should encompass structured formal training that includes both theoretical and practical components, small group training to enhance the quality of education, and ongoing training initiatives to support the

knowledge advancement of nurses(23, 28, 35). Sakuramoto (2023) and Endacott (2015) emphasized that novice nurses require both foundational and advanced knowledge in areas such as pharmacology, respiratory care, and the diagnosis of complex diseases(13, 27). The application of evidence-based training and integrated educational programs, such as advanced simulations, has contributed to the enhancement of theoretical knowledge(34, 35).

Emotional intelligence, stress management, and emotional support are essential competencies identified for nurses working in intensive care units. It has been noted that effective stress management and the development of emotional intelligence are critical factors for success in high-pressure environments such as intensive care units. Nurses who are new to the intensive care setting often experience a range of emotions, including excitement, anxiety, stress, and fear(26). Patients in the intensive care unit require additional emotional and psychological support from nurses. Therefore, newly hired nurses must develop skills to manage the stress and pressures associated with working in this demanding environment(38). Murphy and colleagues (2020) emphasized that a robust mentoring program and emotional support from colleagues can assist newly hired nurses in navigating daily challenges. Research indicates that training related to end-of-life care and palliative care can reduce burnout and stress while enhancing nurses' emotional competencies(43, 47).

In general, the training of newly recruited nurses in intensive care units faces numerous challenges not only in Iran but also in many other countries. This study aims to identify the expected competencies for nurses working in intensive care, to establish the necessary clinical qualifications to ensure the employment of clinically competent nurses in these critical care settings. Additionally, it seeks to establish specialized training programs to prepare and develop clinical competencies among this group of nurses. Given the sensitivity of this matter, it is important to conduct performance evaluations of these nurses in the intensive care unit. The literature review conducted in this study encountered certain limitations, particularly regarding the use of standard search terms in databases. To address this issue, all synonyms of the search terms were utilized separately in both Persian and English. Another significant limitation was the lack of access to the full texts of some articles. In such cases, correspondence was initiated with the original authors to obtain the article files, and if the authors did not provide the requested files, those articles were excluded from the study.

Conclusion

Newly graduated nurses require a blend of clinical skills, management abilities, theoretical knowledge, clinical decision-making, critical thinking, and problem-solving skills, as well as communication, time management, preparedness, and emotional intelligence to succeed in the intensive care unit. Given the complexity of this environment, comprehensive and ongoing educational programs that focus on developing these skills can help bridge existing gaps, enhance clinical leadership, and boost the confidence of new nurses, ultimately leading to improved quality of care and patient satisfaction.

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Conflicts of interest

There are no conflicts of interest present.

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