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Review Article

ICU nurse competencies with a focus on patient safety: a scoping review*

Competências do enfermeiro de terapia intensiva com foco na segurança do paciente: revisão de escopo

Competencias del enfermero de cuidados intensivos con enfoque en seguridad del paciente: revisión del alcance

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***** Extracted fro the thesis "*Construção e validação de um instrumento para avaliação das competências do enfermeiro em unidade de terapia intensiva com foco na segurança do paciente*", Graduate Program in Nursing Care Management – Professional Modality, *Universidade Federal de Santa Catarina*, 2023.

Abstract

Objective: to identify competencies that allow assessing adult Intensive Care Unit nurses with a focus on patient safety. **Method:** a scoping review in which articles were included without time or language limitations on the topic of nursing competency in intensive care and patient safety. Two reviewers independently read the studies in full. **Results:** thirty-four studies were included, and the following groups of competencies were identified: general competencies, clinical observation and judgment, critical thinking, resource management, patient safety, care management, teamwork competencies, and theoretical knowledge. **Conclusion:** careful assessment of patients, use of scientific evidence, decision-making, patient-centered care, technical and non-technical competencies, communication, leadership, and care planning were cited as core competencies for ICU nurses with a focus on patient safety.

Descriptors: Clinical Competence; Patient Safety; Intensive Care Units; Critical Care Nursing; Nursing

Resumo

Objetivo: identificar competências que permitam avaliar o enfermeiro de unidade de terapia intensiva adulto, com foco na segurança do paciente. **Método:** revisão de escopo em que foram incluídos artigos sem limitação temporal e de idiomas com a temática competência do enfermeiro em terapia intensiva e segurança do paciente. Dois revisores realizaram a leitura dos estudos na íntegra, de forma independente. **Resultados:** foram incluídos 34 estudos e identificados os seguintes grupos de competências: Competências gerais, Observação e julgamento clínico, Pensamento crítico, Gerenciamento de Recursos, Segurança do paciente, Gerenciamento do cuidado, Habilidades de trabalho em equipe, e Conhecimentos teóricos. **Conclusão:** avaliação criteriosa dos pacientes, uso de evidências científicas, tomada de decisão,

cuidado centrado no paciente, habilidades técnicas e não técnicas, comunicação, liderança, e planejamento do cuidado foram citados como competências essenciais ao enfermeiro de terapia intensiva com foco na segurança do paciente.
Descritores: Competência Clínica; Segurança do Paciente; Unidades de Terapia Intensiva; Enfermagem de Cuidados Críticos; Enfermagem

Resumen

Objetivo: identificar competencias que permitan la evaluación del enfermero adulto de Unidad de Cuidados Intensivos con enfoque en la seguridad del paciente. **Método:** revisión de alcance, en la que se incluyeron artículos sin limitaciones de tiempo ni de idioma sobre el tema de competencia enfermera en cuidados intensivos y seguridad del paciente. Dos revisores leyeron los estudios completos de forma independiente. **Resultados:** se incluyeron 34 estudios y se identificaron los siguientes grupos de habilidades: habilidades generales, observación y juicio clínico, pensamiento crítico, gestión de recursos, seguridad del paciente, gestión de la atención, habilidades de trabajo en equipo, y conocimientos teóricos. **Conclusión:** la evaluación cuidadosa de los pacientes, el uso de evidencia científica, la toma de decisiones, la atención centrada en el paciente, las habilidades técnicas y no técnicas, la comunicación, el liderazgo y la planificación de la atención se citaron como competencias esenciales para las enfermeras de cuidados intensivos con un enfoque en la seguridad del paciente.
Descriptores: Competencia Clínica; Seguridad del Paciente; Unidades de Cuidados Intensivos; Enfermería de Cuidados Críticos; Enfermería

Introduction

Unsafe healthcare practices are considered to be highly causative of disability and death.[1-2] When we talk about ICU nurse competencies with a focus on patient safety, we include all competencies that can contribute to better patient care, thinking about their safety. Nursing care in Intensive Care Units (ICUs) can save the lives of patients in acute and critically ill situations. However, due to its complexity, failures in care and lack of adherence to good practices can lead to an increased risk of harm to patients. Good practices include bundles for preventing healthcare-associated infections, skills and competencies such as specific technical and scientific knowledge and decision-making as well as communication and leadership towards the team.[2]

It is necessary to understand competencies that relate to patient safety and whose understanding has evolved because of the increasing sophistication of health systems and the increase in adverse outcomes related to patient care. Moreover, issues related to organizational culture and concern with internalizing safety beliefs, values, and attitudes, translating them into care, indicate a commitment to maintaining an error-free environment, emphasizing the culture of reporting.[3]

The ICU provides care to patients with acute, complex and severe conditions. Technological advances and the complexity of critically ill patients require nurses to maintain competencies consistent with the ability to provide safe care.[1] Healthcare safety and quality are supported by professionals who have technical-scientific knowledge and specific competencies in clinical specialties and areas of activity.[4-5]

Nurses working in intensive care play an essential role in the multidisciplinary team, as they perform their work in a holistic and patient-centered manner. The ability to make judgments and make decisions in complex situations, such as those that occur in the care of critically ill patients, is related to professional experience and clinical competencies.[4,6-7]

Competency, therefore, can be defined based on a combination of skills, knowledge, attitudes and values that underpin a given performance, or even as the performance of actions based on technical, critical thinking and interpersonal competencies.[8] Competency in nursing therefore affects, in addition to the nurses themselves (as its absence can lead to frustration and dissatisfaction with their work), patient safety, as there are impacts on the practice environment, both in the ethical climate for the development of work and in the quality of bedside actions, records, and clinical reasoning.[9-10]

Such competencies are related to patient care and to technical and social competencies, cognitive abilities, and even personality traits of professionals, and must be improved for care with a view to patient safety.[10] It is essential to identify areas of professional development and training needs for nurses to ensure the best possible care for critically ill patients.[11-12] A focus on patient safety is essential to protect patients from unnecessary risks and dangers.[9,11]

The present study aims to identify competencies that allow assessing adult ICU nurses with a focus on patient safety.

Method

This is a scoping review that sought to map the main concepts involved in a research field, clarify definitions/conceptual boundaries of a topic, explore the breadth of literature on a given topic, identify knowledge gaps, examine how research is conducted on a given topic, and identify the main characteristics or factors related to a specific concept. This study followed the JBI methodological recommendations.[13-14]

The research question was structured by the mnemonic PCC (Population, Concept and Context), in which Population included nurses; Concept included clinical and professional competency with a focus on patient safety; and Context included adult ICU.

We searched for articles in the following databases/digital libraries: CINAHL (Cumulative Index to Nursing and Allied Health Literature), LILACS (Latin American and Caribbean Literature in Health Sciences), BDENF (Nursing Database), MEDLINE (Medical Literature Analysis and Retrieval System Online), SciELO (Scientific Electronic Library Online), Embase, Scopus and Web of Science. We included articles without time or language limitations on the topic of adult ICU nurses' competencies and assessment scales. Due to the large volume of publications in scientific journals, we decided not to include gray literature.

The search was carried out from October to December 2023. The scoping review protocol was entered into the OSF platform with the identifier: DOI 10.17605/OSF.IO/HAU2B. Descriptors in English, Portuguese and Spanish were used, selected from MeSH (Medical Subject Heading Terms) and DeCS (Health Sciences Descriptors) as well as synonyms of descriptors, in order to expand the search, established with the help of a librarian (Chart 1).

Chart 1 – Search strategies, Florianópolis, SC, Brazil, 2023

Database/ digital library	**Search strategy**
MEDLINE	(("Patient Safety"[Mesh] OR "Patient Safety"[Title/Abstract] OR "Patients Safety"[Title/Abstract] OR "Safe Patient"[Title/Abstract] OR "Safe Patients"[Title/Abstract] OR "patient protection"[Title/Abstract] OR "Safety Management"[Mesh] OR "Safety Management"[Title/Abstract] OR "Security Measures"[Mesh] OR "Security Measures"[Title/Abstract] OR "Security Measure"[Title/Abstract]) AND ("Intensive Care Units"[Mesh] OR "Intensive Care Units"[Title/Abstract] OR "Intensive care"[Title/Abstract] OR "ICU"[Title/Abstract] OR "Intensive cares"[Title/Abstract]) AND ("Professional Competence"[Mesh] OR

	"Professional Competence"[Title/Abstract] OR Competenc*[Title/Abstract] OR Skill*[Title/Abstract] OR "Clinical Competence"[Mesh] OR "Clinical Competence"[Title/Abstract] OR "Competency-Based Education"[Mesh] OR "Competency-Based Education"[Title/Abstract]) AND ("Nursing"[Mesh] OR "Nursing"[Title/Abstract] OR Nurs*[Title/Abstract] OR "Nurses"[Mesh] OR "Nurses"[Title/Abstract]) AND (journal article[policátions type]))
Embase	(("Patient Safety" OR "Patients Safety" OR "Safe Patient" OR "Safe Patients" OR "patient protection" OR "Safety Management" OR "Security Measures" OR "Security Measure") AND ("Intensive Care Units" OR "Intensive care" OR "ICU" OR "Intensive cares") AND ("Professional Competence" OR Competenc* OR Skill* OR "Clinical Competence" OR "Competency-Based Education") AND ("Nursing" OR Nurs* OR "Nurses"))
CINAHL	((MH "Patient Safety"+) OR (TI "Patient Safety" OR AB "Patient Safety") OR (TI "Patients Safety" OR AB "Patients Safety") OR (TI "Safe Patient" OR AB "Safe Patient") OR (TI "Safe Patients" OR AB "Safe Patients") OR (TI "patient protection" OR AB "patient protection") OR (MH "Safety Management"+) OR (TI "Safety Management" OR AB "Safety Management") OR (MH "Security Measures"+) OR (TI "Security Measures" OR AB "Security Measures") OR (TI "Security Measure" OR AB "Security Measure")) AND ((MH "Intensive Care Units"+) OR (TI "Intensive Care Units" OR AB "Intensive Care Units") OR (TI "Intensive care" OR AB "Intensive care") OR (TI ICU OR AB ICU) OR (TI "Intensive cares" OR AB "Intensive cares")) AND ((MH "Professional Competence"+) OR (TI "Professional Competence" OR AB "Professional Competence") OR (TI Competenc* OR AB Competenc*) OR (TI Skill* OR AB Skill*) OR (MH "Clinical Competence"+) OR (TI "Clinical Competence" OR AB "Clinical Competence") OR (MH "Competency-Based Education"+) OR (TI "Competency-Based Education" OR AB "Competency-Based Education")) AND ((MH Nursing+) OR (TI Nursing OR AB Nursing) OR (TI Nurs* OR AB Nurs*) OR (MH Nurses+) OR (TI Nurses OR AB Nurses))
Scopus	(("Patient Safety" OR "Patients Safety" OR "Safe Patient" OR "Safe Patients" OR "patient protection" OR "Safety Management" OR "Security Measures" OR "Security Measure") AND ("Intensive Care Units" OR "Intensive care" OR "ICU" OR "Intensive cares") AND ("Professional Competence" OR Competenc* OR Skill* OR

	"Clinical Competence" OR "Competency-Based Education") AND ("Nursing" OR Nurs* OR "Nurses"))
Web of Science	(("Patient Safety" OR "Patients Safety" OR "Safe Patient" OR "Safe Patients" OR "patient protection" OR "Safety Management" OR "Security Measures" OR "Security Measure") AND ("Intensive Care Units" OR "Intensive care" OR "ICU" OR "Intensive cares") AND ("Professional Competence" OR Competenc* OR Skill* OR "Clinical Competence" OR "Competency-Based Education") AND ("Nursing" OR Nurs* OR "Nurses"))
LILACS/ BDENF	(("Segurança do Paciente" OR "Segurança dos Pacientes" OR "Segurança ao Paciente" OR "Segurança aos Pacientes" OR "Segurança de Paciente" OR "Segurança de Pacientes" OR "Paciente seguro" OR "Pacientes seguros" OR "proteção do paciente" OR "Gestão da Segurança" OR "Medidas de Segurança" OR "Medida de Segurança" OR "Seguridad del Paciente" OR "Seguridad de los pacientes" OR "Seguridad del Pacientes" OR "Seguridad al paciente" OR "protección del paciente" OR "Administración de la Seguridad" OR "Medidas de Seguridad" OR "Medida de Seguridad" OR "Patient Safety" OR "Patients Safety" OR "Safe Patient" OR "Safe Patients" OR "patient protection" OR "Safety Management" OR "Security Measures" OR "Security Measure") AND ("Unidades de terapia intensiva" OR "Unidade de terapia intensiva" OR "UTI" OR "CTI" OR "Centro de Terapia Intensiva" OR "Centros de Terapia Intensiva" OR "terapia intensiva" OR "centro intensivo" OR "centros intensivos" OR "cuidados intensivos" OR "cuidado intensivo" OR "Cuidados Críticos" OR "Cuidado Crítico" OR "Unidades de Cuidados Intensivos" OR "Unidade de Cuidados Intensivos" OR "UCI" OR "Intensive Care Units" OR "Intensive care" OR "ICU" OR "Intensive cares") AND ("Competência Profissional" OR Competência* OR "Competência Clínica" OR "Educação Baseada em Competências" OR "Competencia Profesional" OR "Educación Basada en Competencias" OR "Professional Competence" OR Competenc* OR Skill* OR "Clinical Competence" OR "Competency-Based Education") AND ("Enfermagem" OR enfermeir* OR "enfermeria" OR enfermer* OR "Nursing" OR Nurs* OR "Nurses"))
SciELO	(("Segurança do Paciente" OR "Segurança dos Pacientes" OR "Segurança ao

	Paciente" OR "Segurança aos Pacientes" OR "Segurança de Paciente" OR "Segurança de Pacientes" OR "Paciente seguro" OR "Pacientes seguros" OR "proteção do paciente" OR "Gestão da Segurança" OR "Medidas de Segurança" OR "Medida de Segurança" OR "Seguridad del Paciente" OR "Seguridad de los pacientes" OR "Seguridad del Pacientes" OR "Seguridad al paciente" OR "protección del paciente" OR "Administración de la Seguridad" OR "Medidas de Seguridad" OR "Medida de Seguridad" OR "Patient Safety" OR "Patients Safety" OR "Safe Patient" OR "Safe Patients" OR "patient protection" OR "Safety Management" OR "Security Measures" OR "Security Measure") AND ("Unidades de terapia intensiva" OR "Unidade de terapia intensiva" OR "UTI" OR "CTI" OR "Centro de Terapia Intensiva" OR "Centros de Terapia Intensiva" OR "terapia intensiva" OR "centro intensivo" OR "centros intensivos" OR "cuidados intensivos" OR "cuidado intensivo" OR "Cuidados Críticos" OR "Cuidado Crítico" OR "Unidades de Cuidados Intensivos" OR "Unidade de Cuidados Intensivos" OR "UCI" OR "Intensive Care Units" OR "Intensive care" OR "ICU" OR "Intensive cares") AND ("Competência Profissional" OR Competência* OR "Competência Clínica" OR "Educação Baseada em Competências" OR "Competencia Profesional" OR "Educación Basada en Competencias" OR "Professional Competence" OR Competenc* OR Skill* OR "Clinical Competence" OR "Competency-Based Education") AND ("Enfermagem" OR enfermeir* OR "enfermeria" OR enfermer* OR "Nursing" OR Nurs* OR "Nurses"))

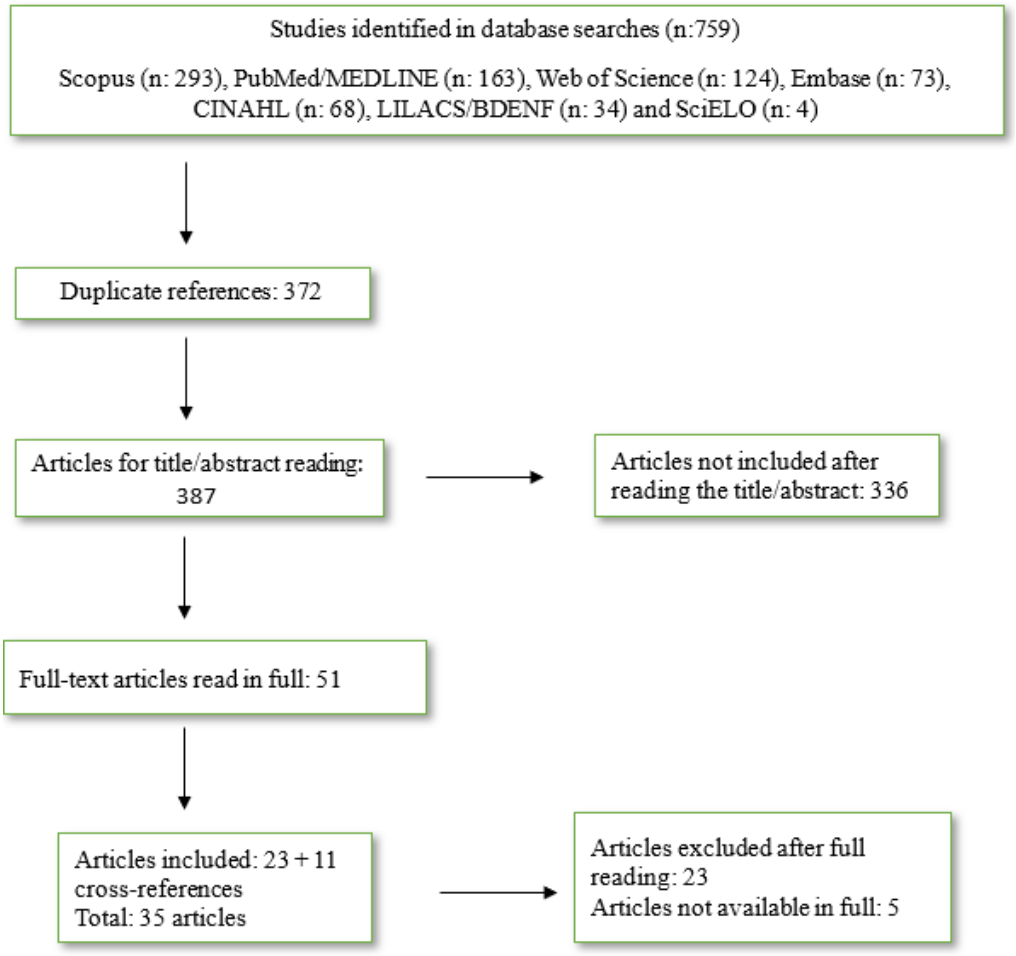
The articles were organized using Mendeley software, which identified 372 duplicate studies. The titles and abstracts were assessed, and those that met the inclusion criteria after being read in full were included.

Two independent reviewers read the 51 articles in full and reached a consensus regarding inclusions: 23 articles and 11 studies identified as relevant during the full reading. There was no need for a third reviewer.

Results

A total of 759 studies were identified, with the largest number in Scopus (293), followed by PubMed/MEDLINE (163), Web of Science (124), Embase (73), CINAHL (68), LILACS/BDENF (34) and SciELO (4) (Figure 1).

Figure 1 – Process of inclusion and exclusion of studies found according to PRISMA-ScR recommendations. Florianópolis, SC, 2023



The data were extracted from the objective, identifying the most predominant subjects related to nursing competency in ICU, which will be called domains, and related aspects within each domain, which will be called subdomains (Chart 2).

Chart 2 – Studies that addressed the topic of nursing competency in Intensive Care Units. Florianópolis, 2024

Study design	Objective	Domains addressed
Multicenter cross-sectional[15]	Measure the self-assessed level of patient observation competencies of ICU nurses and explore factors associated with these competencies.	Observation of patient clinical condition
Multicenter cross-sectional[16]	Assess ICU nurses' level of knowledge in patient observation and explore the factors associated with it.	Clinical competency and professional competency
Cross-sectional study[17]	Compare the level of critical thinking in surgical and ICU nurses and investigate the factors that explain it.	Critical thinking
Exploratory study[18]	Explore ICU nurses' performance in a simulation-based emergency	Non-technical competencies, crisis resource management.
Cross-sectional study[19]	Examine hospital nurses' patient safety competencies and the association between these competencies and safety climate.	Patient safety competency, teamwork, communication, safety risk management, safety culture
Cross-sectional, descriptive and exploratory study[20]	Develop a questionnaire to assess critical care nursing competency related to patient safety.	Patient safety competency
Prospective comparative research[21]	Test an objective assessment of clinical competency called Time to Task.	Clinical judgment
Methodological research: translation and validation[22]	Determine the psychometric properties of the Intensive and Critical Care Nursing Competence Scale	Clinical competency and professional competency

	version 1 among Iranian nurses.	
Multicenter, cross-sectional study[23]	Investigate the core competencies and factors influencing ICU nurses' capabilities in Chinese hospitals.	Core competencies, technical competencies
Cross-sectional study[24]	Assess nurses' perceived competencies and attitudes toward safety concepts and examine their impact on medication administration errors.	Patient safety competency
Cross-sectional study [25]	Develop and validate the psychometric properties of the Nursing Critical Thinking in Clinical Practice Questionnaire, designed to assess nurses' critical thinking competencies.	Critical thinking
Methodological research[26]	Develop a scale to assess core competency in intensive and critical care nursing	Core competencies
Descriptive, comparative study[27]	Determine the construct validity of the Australian College of Critical Care Nurses competency standards as a tool to assess specialist critical care nurses' clinical practice in Australia.	Advanced theoretical knowledge and empirical/clinical practice
Methodological study[28]	Determine what competencies are expected of graduate critical care nurses.	Professional, ethical and legal practice, care delivery, leadership and management, and professional, personal and quality development
Cross-sectional, qualitative and	Determine the incidence of adverse events during intrahospital transport and obtain suggestions for improving	Patient safety competency

quantitative study[29]	this process.	
Quali, constructivist study[30]	Explore the experiences of ICU nurses and physicians regarding critical incidents during intrahospital transport of ICU patients.	Patient safety competency
Does not mention the study design[31]	Provide an overview of the Standards for Nurse Staffing in Critical Care document.	Care management
Qualitative/descriptive study[32]	Describe ICU nurses' experiences when learning to manage vasoactive drugs and highlight the competency required for their management.	Core competencies
Ethnographic observation[33]	Understand the ways in which the cultural process increases patient safety by establishing and maintaining barriers to adverse events.	Patient safety competency
Meta-ethnography[34]	Develop a conceptual framework of ICU nurses' main qualities and competencies based on experiences of intensive care patients, their families and ICU nurses.	Teamwork competencies
Correlational, cross-sectional study[35]	Explore the association between registered nurse competency and patient safety, as defined by rates of occurrence of six types of adverse events related to nursing care in the ICU.	Patient safety competency
Hierarchical linear modeling[36]	Explore the relationship between the proportion of registered nurses and	Patient safety competency

	the risk of patient harm.	
Cross-sectional study[37]	Explore the effectiveness of a digital learning management system in improving ICU nurses' critical thinking competencies and knowledge.	Advanced theoretical knowledge and empirical practice, critical thinking
Exploratory, descriptive, qualitative design[38]	Explore nurses' perspectives and strategies for managing patients with respiratory failure admitted to the ICU.	Patient observation, crisis management
Reflection[39]	Nurses should develop the ability to communicate their concerns proactively and objectively to those in a position to respond, participate in decision-making, and problem-solving.	Patient safety competency
Reflection[40]	Explore the factors that affect critical care and highlight the limitations that may be perceived in the workforce.	Patient clinical observation
Descriptive, cross-sectional, correlational study[41]	Identify the level of critical thinking of nurses in clinical practice according to sociodemographic and professional variables.	Critical thinking
Cross-sectional study[42]	Identify competency requirements by soliciting the opinion of ICU nurses and physicians.	Core competencies
Qualitative study[43]	Identify competency standards for critical care nurse specialists.	Teamwork competencies, leadership
Document analysis and literature review[44]	Generate evidence that incorporates the national perspective on priorities for core competencies.	Core competencies

Qualitative study[45]	Develop a set of core competencies.	Core competencies
Descriptive qualitative study[46]	Provide a comprehensive description of the multiple competencies in patient observation in intensive care nursing.	Observation of patient clinical condition
Functional analysis method[47]	Develop a framework of intensive care competencies.	Care management
Literature review [48]	Examine how studies have defined or described the concept of nursing competency in intensive and critical care.	Clinical and professional competency

Discussion

The development of competencies in the ICU tends to indicate safe patient care; however, acting with situational awareness and critical thinking, implementing good practices, is also a competency expected of nurses in this unit.

Core general competencies

Core competencies indicate the preliminary competencies that nurses need to provide care in intensive therapy, divided into core clinical and professional competencies.[26] Comparatively, clinical competencies were defined as nurses' ability to effectively perform bedside patient care actions, and professional competencies were more related to the activities of the profession in general.[26,42]

Clinical competency is divided into three subdomains: principles of care, clinical guidelines, and nursing interventions. Professional competency is divided into four subdomains: ethical activity and familiarity with health-related laws, decision-making, activity development, and collaboration. Within these subdomains, aspects of patient safety, patient-centered care, knowledge of clinical guidelines and codes of ethics, decision-making, and critical thinking were addressed.[26,42]

Core competency was defined as the ability to integrate various ways of thinking about the profession and technical competencies. A study[23] that investigated the current state of

core competencies and factors that influence them for ICU nurses identified seven subdomains: ethics, clinical practice, nurse-nurse cooperation, assessment and decision-making, personal and professional development, teaching and research, and physician-nurse cooperation.[23] The study also highlighted the importance of ICU nurses in patient safety actions, which affects the outcome and prognosis of critically ill patients.[23]

Among the core competencies, vasoactive drug management was cited as essential knowledge for ICU nurses, due to its widespread use, as well as the ability to detect and examine changes to assess the risk of adverse effects of a medication. Nurses need a theoretical knowledge base for competency related to vasoactive drugs as well as cognitive and mental competencies, affective learning (related to stress management in challenging situations), and psychomotor competencies.[32]

Technical competencies, teamwork competencies, communication competencies with patients, family members and multidisciplinary teams, and constant and attentive presence at the bedside were highlighted as essential. The importance of maintaining respectful relationships of person-centered care and situational and emotional awareness were also highlighted.

Clinical observation and judgment

Patient clinical observation was cited as an important responsibility of ICU nurses and a core component of clinical competency as it contributes to patient safety and provides data for a careful assessment of patients' situation and appropriate decision-making.[15-16,46]

A study[12] that aimed to measure ICU nurses' patient observation competencies identified the following factors associated with these competencies: length of experience, confidence in one's own competency, intensive care as the preferred field of activity, education, and incorporation of scientific evidence into practice.

Observation competencies/ability have also been cited in other studies as a core competency. Aspects such as assimilation, interpretation and assessment of information, planning and preparation of interventions, prevention and prediction of deterioration and exacerbation of patient symptoms have been reported.[38,40] Clinical training in the ICU is essential to ensure adequate competencies in observation of critically ill patients.

These competencies can be developed during undergraduate nursing education by providing students with opportunities for clinical training in intensive care and in virtual learning settings.[15]

Clinical judgment involves interpreting patients' needs and making decisions about the interventions considered appropriate. It is a complex activity that requires flexibility and skill to recognize a clinical situation and respond satisfactorily.[49-50]

A study[21] assessed clinical judgment among intensive care specialist nurses and novice nurses, based on the aspects of focused observation, recognition of deviations from expected clinical patterns, planned interventions, communication, assessment/self-analysis, and commitment to improving care. Based on this, it highlighted the use of observation for collecting objective and subjective data, in order to recognize subtle changes in the data that explain patients' condition and guide interventions.[21] To achieve clinical judgment competency, nurses need knowledge of the physiology and clinical manifestations that patients may present.[50]

Critical thinking

Critical thinking is a cognitive process in which nurses, through observation of the situation and analysis of available information, reach a conclusion and can thus make a decision, being a core competency within the intensive and highly complex therapy environment.[17] Analysis, assessment, inference, inductive reasoning and deductive reasoning, the ability to understand clinical changes in patients' condition, and prioritization of nursing procedures are also fundamental indicators for ICU nurses with a focus on patient safety.[17]

Another study identified four aspects of critical thinking assessment, such as personal characteristics, attitudes, beliefs and values that act as triggers for critical thinking competencies and intellectual and cognitive competencies, which include knowledge and understanding of nursing and the decision-making process, interpersonal and self-management competencies, which favor communication and recording of information relevant to patients, in addition to technical competencies.[25,41]

ICU nurses' critical thinking competencies are considered essential for maintaining quality of care as they also encompass assessment, cognition, and accuracy

of intensive care as well as the rapid detection of severe cases that require priority intervention. Decision-making and problem-solving processes require advanced critical thinking competencies, and measuring this competency is important to identify deficits and the need for development of nurses' cognitive capacity.[37,41]

Resource management

Resource management aims to coordinate, utilize, and apply available resources to help optimize patient safety and outcomes by preventing and mitigating errors.[18] Within this domain, the subdomain of non-technical competencies was identified, which is divided into six categories: situational awareness, decision-making, communication, teamwork, leadership, and stress and fatigue management.[18]

Another study also cited the non-technical competencies of situational awareness, decision-making, and collaboration. According to the nurses interviewed, for rapid decision-making, it is necessary to predict the development of patients' condition, and nurses must have autonomy in decision-making and collaborate with team members to achieve a common understanding of the situation and priority interventions and actions.[38]

Patient safety

Nurses play a fundamental role in patient safety and the results achieved are directly related to a competent nursing team.[39] Patient safety competency concerns the knowledge, competencies and attitudes necessary for nurses in relation to patient safety for providing safe healthcare. It should examine hospital nurses' patient safety competencies from the domains of teamwork, communication, safety risk management, human and environmental factors, recognition of adverse events, and safety culture.[19]

Nursing competency assessment in intensive care related to patient safety was organized into four subdomains: decision-making, collaboration, nursing intervention and principles of nursing care. Team communication and collaboration were addressed as core competencies to avoid adverse events and ensure high-quality care.[20] Nurses are the main provider of information to patients, family members, and other members of the interdisciplinary team.[40]

Bedside nurses' attitudes and competencies have an impact on safety concepts, medication administration errors, and adherence to safe medication administration practices.[24] Nurses' technical competencies, situational awareness, and leadership towards the team are crucial for the safety of critically ill patients during intra-hospital transport.[29] Knowledge, experience, and planning are aspects related to the competency expected for safe intra-hospital transport.[30]

Aspects such as being prepared for emergencies, having a comprehensive perception of the unit, and showing a sense of responsibility for patients' well-being were highlighted within the scope of patient safety.[33] The ability to identify situations that require attention and vigilance was also cited as a competency related to patient safety. Nurses should always clarify the circumstances of the assignment requested in order to assess whether it is possible to complete a task safely as well as work together with the team to identify possible safety concerns.[39]

Care management

ICU nurses must provide effective, safe and appropriate care, managing and supporting staff and patients, and acting as communicators within the multidisciplinary team, in addition to using protocols in the care of critically ill patients, constantly assessing patients' condition, and being flexible to change conduct as needed.[31]

The development of a critical care competency framework needs to identify three key aspects of a competent nurse: assessment/interpretation, therapeutic intervention, and assessment strategies.[47] These result in the following competencies: intervention and therapeutic regimen management, and care plan development and management.[47] Regarding care management, leadership and management can be broken down into issues that address delegation and supervision of tasks, interdisciplinary collaboration, motivation, conflict management, risk and quality management, among others.[28]

Teamwork competencies

Nurses working in intensive care need to develop competencies related to teamwork. Sharing responsibilities, information, and interaction and consensus among the team are essential to achieve mutual goals for patients and their families. Providing a good professional

team climate, the ability to resolve conflicts, and awareness of the impact of one's own behavior are also cited as important to ensure an adequate work environment.[34]

A necessary competency is nurses' collaborative and supportive posture with other team members in order to achieve the desired results.[40] The ability to communicate with patients, family members, and the multidisciplinary team is cited as essential for creating a participatory and trustworthy care environment.[34]

Theoretical knowledge

Critically ill patients with multiple organ dysfunction and hemodynamic instability require ICU nurses to combine advanced theoretical knowledge and empirical practice to meet the needs of critically ill patients.[34] In certain areas, advanced theoretical knowledge is required by nurses: sepsis management, evidence-based care, hemodynamic testing, sedation and pain assessment, palliative care, acute and critical medications, electrocardiogram (ECG) interpretation, assessment of illness severity, patient physical assessment in the ICU, and infection control care bundles.[37]

A study[24] included the following domains: qualification, clinical problem-solving, professional practice, reflective practice, teamwork, and leadership. Regarding clinical problems, the need to develop interpretative competencies and respond effectively to changing situations was addressed as well as competencies to develop and manage a care plan.[27]

As a limitation of this study, it is pointed out that the impossibility of accessing five articles that were not available in full may have affected the results.

Conclusion

Due to the complexity of intensive care and the particularities of caring for critically ill patients, it is important for nurses to understand and develop the competencies necessary to act safely and with quality. Through this review, it was possible to identify which nurses' competencies were most addressed in articles, with the most prominent being observation, clinical judgment, critical thinking, resource management, general and patient safety competencies, care management, teamwork competencies, and theoretical knowledge.

Although patient safety is one of the attributes or dimensions of the quality of healthcare services, poor care practices are the result of several factors that influence the occurrence of adverse events, and thinking about the competencies required for ICU nurses, from the perspective of patient safety, is still necessary.

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