The application of nursing diagnoses in Intensive Care Units: A scoping review of clinical indicators and patient outcomes

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Abstract

Background: Nursing diagnoses are essential in Intensive Care Units (ICUs) for guiding decisions, prioritizing care, and improving outcomes. However, inconsistent terminology and documentation burdens hinder their effective implementation and evaluation.
Purpose: The aimed of this study was to examine the application of nursing diagnoses in ICUs, exploring their relationships with clinical indicators, patient outcomes, and the impact of standardized diagnostic frameworks on nursing practice.
Methods: This scoping review followed PRISMA-ScR guidelines We searched PubMed, CINAHL, Scopus, and Web of Science from 2019 to 2024. Studies examining nursing diagnoses in ICU settings were included. The reviewers independently screened 527 records, with nineteen full-text articles assessed for eligibility, resulting in thirteen included studies.
Results:. Thirteen studies with diverse methodologies from multiple countries were analyzed. Four key themes emerged: 1) Clinical indicators linked to specific nursing diagnoses, particularly respiratory conditions where impaired spontaneous ventilation was associated with dyspnea, fever, fatigue, and cough; 2) Implementation processes for nursing diagnoses, including electronic health records and nurse-delivered thoracic ultrasound that enhanced clinical decision-making; 3) Diagnostic validation and prevalence studies highlighting the importance of standardized frameworks for accurate diagnosis; and 4) Interventions that improved nursing practice and patient outcomes, including the institutionalization of nursing processes and development of electronic care plans.
Conclusions: Standardized nursing diagnoses optimize ICU patient care by providing a structured approach to assessment, intervention planning, and outcome evaluation. Technology integration and consistent terminology enhance diagnostic accuracy and intervention effectiveness. Future research should focus on validating these frameworks across diverse ICU settings and patient populations to establish best practices for implementation.

Keywords: clinical indicators; intensive care units; nursing diagnoses; patient outcome; standardization

Introduction

The intensive care unit (ICU) constitutes a complex healthcare environment,

characterized by the management of critically ill patients with diverse and often rapidly evolving health needs (Leong et al., 2023). Within this dynamic setting, effective patient assessment, care planning, and intervention strategies are crucial for ensuring optimal outcomes (Kotfis et al., 2024; Latour et al., 2022). Patients in ICUs typically present with multiple comorbidities and require specialized, vigilant attention from interdisciplinary healthcare teams working in coordination to provide timely and effective interventions.

Nursing diagnoses serve as essential tools that guide clinical decision-making and promote patient-centered care within ICUs (Chung et al., 2021; Rahne, 2023). These diagnoses provide a systematic framework for identifying and addressing complex health needs, extending beyond mere categorization of patient conditions to offer a structured approach for comprehensive assessment, individualized care planning, and interdisciplinary collaboration (Allum et al., 2020). Through systematic analysis of patient data and clinical indicators, nurses can identify actual and potential health problems, prioritize interventions, and monitor patient responses with precision and efficiency (Buyukyilmaz et al., 2020; Cardoso et al., 2020).

The body of literature concerning nursing diagnoses in ICUs has undergone significant evolution, mirroring advancements in critical care practices and shifts in healthcare priorities. Initial studies predominantly concentrated on the development and validation of nursing diagnosis taxonomies (Allum et al., 2020). Subsequent research investigated the implementation of these diagnoses in specific ICU populations, including patients experiencing respiratory failure, sepsis, or trauma (Buyukyilmaz et al., 2020). More recent scholarly work has examined innovative strategies to enhance the utilization of nursing diagnoses, such as the integration of technology and decision support tools (Ghazali et al., 2022).

Despite the recognized importance of nursing diagnoses, significant challenges persist in their implementation and utilization in high-acuity settings. These challenges include inconsistent terminology, documentation burden, and variable integration with electronic health records (Hidayati et al., 2022). Furthermore, there remains a critical gap in our understanding of how specific clinical indicators relate to nursing diagnoses and how standardized diagnostic frameworks impact measurable patient outcomes in ICU environments. While individual studies have examined aspects of nursing diagnoses in specific contexts, no previous review has comprehensively synthesized the evidence linking nursing diagnoses to clinical indicators and patient outcomes across diverse ICU settings.

The challenges associated with implementing nursing diagnoses in ICU necessitates a multifaceted approach involving organizational, educational, and technological interventions. The adoption of standardized terminology and documentation practices, supported by organizational initiatives, can significantly enhance consistency and accuracy (Hidayati et al., 2022). Continuous education is essential for improving nurses' diagnostic proficiency and fostering evidence-based practice. The integration of technology, such as electronic health records, streamlines processes and facilitates collaboration (Lu et al., 2021). Although challenges such as terminology variability and documentation burden persist, addressing these issues can drive innovation and improve patient care.

Addressing this knowledge gap requires a systematic examination of the current evidence. A scoping review methodology was selected for this study due to the heterogeneous nature of research on nursing diagnoses in ICUs and the need to map the available evidence. This approach allows for the inclusion of diverse study designs

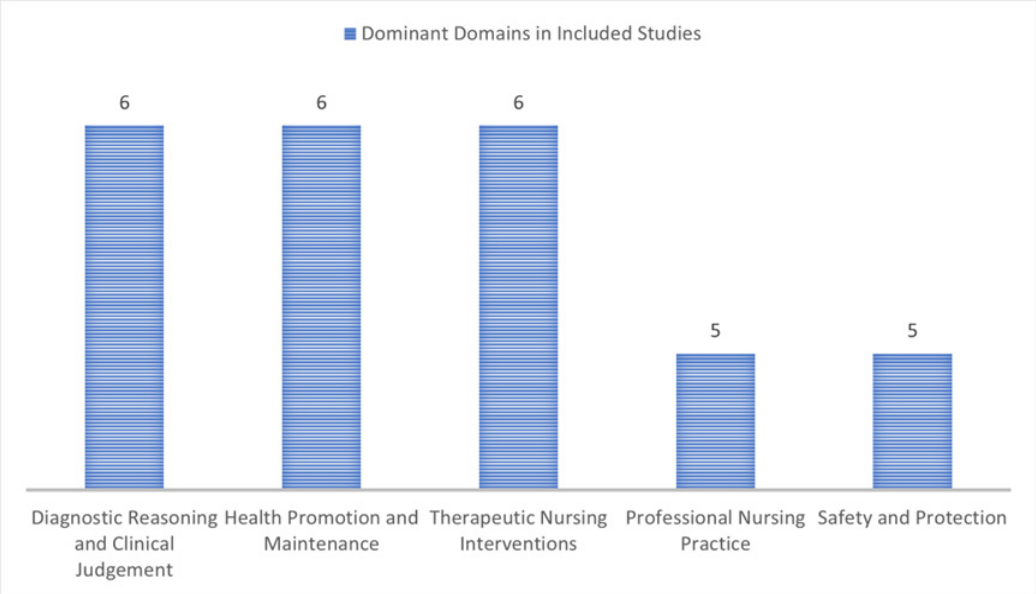

Figure 1. Dominant Domains

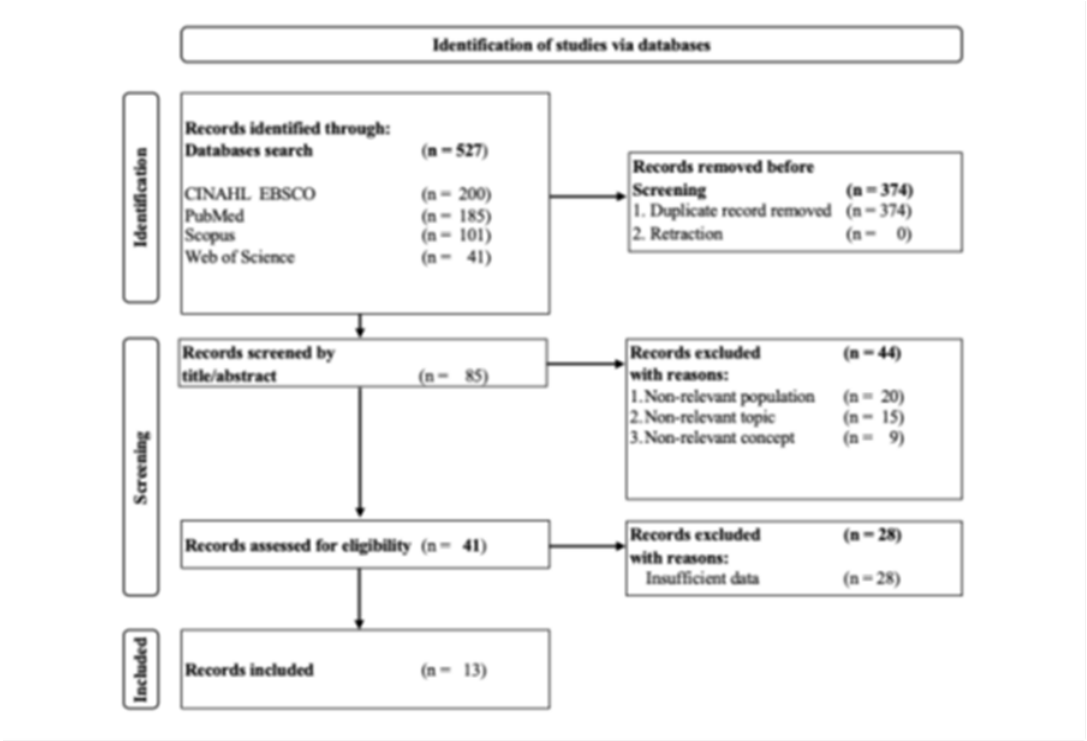

Figure 2. PRISMA-ScR Flow Chart

and methodologies, providing a comprehensive overview of the current state of knowledge in this field. This scoping review aims to examines the significance, challenges, and implications of nursing diagnoses in ICUs. By addressing these objectives, this review seeks to provide clinicians, educators, and researchers with a comprehensive synthesis of evidence to guide practice, education, and future research in this critical area of nursing practice.

Materials and Methods

Protocol and Registration

This study employed a scoping review methodology following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines (Tricco et al., 2018). As scoping reviews are currently ineligible for registration on PROSPERO, no protocol registration was undertaken.

Eligibility Criteria

Studies were included if: (1) focused on nursing diagnoses in intensive care unit settings; (2) were published in peer-reviewed journals between January 2019 and April 2024; (3) were written in English; and (4) examined aspects related to nursing diagnoses including clinical application, implementation strategies, diagnostic accuracy, or patient outcomes. We excluded conference abstracts, editorials, commentaries, letters to editors, and studies focusing solely on nursing diagnoses in non-ICU settings. No restrictions were placed on study design, allowing for the inclusion of quantitative, qualitative, and mixed-methods research to capture the breadth of evidence in this field.

Information Sources and Search Strategy

A comprehensive search of electronic databases was conducted on March 28, 2024, including PubMed, CINAHL Complete, Scopus, and Web of Science. The five-year timeframe (2019-2024) was selected to ensure inclusion of the most current evidence and recent advancements in nursing diagnosis application within intensive care settings. The search strategy employed a combination of controlled vocabulary (MeSH terms) and free-text terms. The core search terms included: (“nursing diagnos*” OR “NANDA” OR “nursing assessment” OR “nursing process”) AND (“intensive care” OR “critical care” OR “ICU” OR “critical illness” OR “critically ill”). The complete search strategy for each database is provided in Supplementary.

Data Extraction and Synthesis

Three independent reviewers screened the titles and abstracts of the retrieved articles to assess their eligibility based on predefined inclusion and exclusion criteria. Full-text versions of potentially relevant studies were then reviewed to determine final inclusion. Any discrepancies among reviewers were resolved through discussion and consensus. Data were extracted systematically using a

Table 1. Characteristics of Included Study

Author(s), years, country	Study design, Participant(s), Aim	Key findings	Domain	Nursing Diagnoses
(Barioni et al., 2022), Brazil	1. A retrospective cohort design 2. 57 adult and elderly patients, diagnosed with COVID-19 3. To identify clinical indicators and nursing diagnoses associated with a higher risk of mortality in critically ill patients with COVID-19.	1. Clinical Indicators: Main symptoms in COVID-19 ICU patients: Dyspnea, fever, fatigue, and cough. Consistent with severe respiratory illness. 2. Nursing Diagnoses: Ineffective Protection, Ineffective Tissue Perfusion, Contamination. Ineffective Breathing Pattern, Impaired Spontaneous Ventilation. Acute Confusion, Frailty Syndrome, Obesity, Decreased Cardiac Output. Limited research on diagnoses in specific domains. 3. Implications: Early recognition of clinical indicators and high-risk diagnoses is critical. Targeted interventions may improve patient survival rates.	1. Physiological Integrity 2. Health Promotion 3. Cognitive-Perceptual 4. Safety and Protection 5. Functional Health Patterns	1. Ineffective Protection 2. Ineffective Tissue Perfusion 3. Contamination 4. Ineffective Breathing Pattern 5. Impaired Spontaneous Ventilation 6. Acute Confusion 7. Frailty Syndrome 8. Obesity 9. Decreased Cardiac Output
(Albuquerque et al., 2023), Brazil	1. A concept analysis based on the framework proposed by Walker and Avant 2. 38 relevant studies of critically ill patients requiring intensive care due to respiratory compromise or related conditions 3. To conduct a comprehensive concept analysis of impaired spontaneous ventilation in critically ill patients within the ICU setting	1. Defining Attributes: Symptoms: Distress, fatigue, dyspnea, anxiety, agitation. Clinical signs: Tachycardia, hemodynamic instability, altered mental status. Lab findings: Abnormal ABG, hypoxemia, hypercapnia. 2. Antecedents: Demographics: Sex, age. Physiological factors: Oxygen saturation <90%, respiratory, cardiovascular, neurological, and metabolic diseases. Medical conditions: Respiratory infections, trauma, exposure to toxins/sedatives. 3. Consequences: Physiological responses: Increased HR, dyspnea, respiratory muscle use, metabolic rate. Clinical impact: Decreased oxygen saturation, restlessness.	1. Physiology Integrity 2. Health Promotion 3. Safety and Protection 4. Cognitive-Perceptual	1. Impaired Spontaneous Ventilation 2. Respiratory Distress 3. Dyspnea 4. Anxiety 5. Agitation 6. Tachycardia 7. Hemodynamic Instability 8. Abnormal Arterial Blood Gas Results 9. Fatigue 10. Sweating 11. Hypoxemia 12. Hypercapnia

Cont. Table 1. Characteristics of Included Study

Author(s), years, country	Study design, Participant(s), Aim	Key findings	Domain	Nursing Diagnoses
(Fritzen et al., 2023), Brazil	1. An experience report methodology 2. Healthcare professionals involved in perioperative care delivery, such as nurses, surgeons, anesthesiologist, and other perioperative team members 3. To implement electronic records of the perioperative nursing process, specifically focusing on the stages of transoperative and immediate postoperative nursing diagnoses, within a health management software system.	1. Implementation Process: Three PDSA cycles were used to integrate electronic perioperative nursing records. Enabled systematic improvement, task assignment, and refinement. 2. Structured Model: Developed for electronic documentation of perioperative nursing. Included 7 aspects, 92 symptoms/signs, and 15 nursing diagnoses. 3. Documentation Improvements: Enhanced completeness and standardization of perioperative records. Defined clear expectations for documentation and task responsibilities. 4. Enhanced Nursing Care: Improved communication and coordination within perioperative teams. Facilitated better patient care planning and delivery.	1. Information Management 2. Quality Improvement 3. Technology Integration 4. Patient-Centered Care	1. Impaired Tissue Integrity 2. Risk for Perioperative Positioning Injury 3. Ineffective Airway Clearance 4. Acute Pain 5. Risk for Infection 6. Risk for Aspiration 7. Impaired Gas Exchange 8. Risk for Hypothermia 9. Risk for Fluid Volume Deficit 10 Anxiety 11. Impaired Mobility 12. Risk for Falls 13. Altered Nutrition: Less Than Body Requirements 14. Risk for Disuse Syndrome 15. Ineffective Coping
(Smits et al., 2023), Netherlands	1. A prospective observational single-center design 2. 65 adult patients admitted to the intensive care unit with indications for thoracic ultrasound examination 3. To investigate the effects of nurse-delivered thoracic ultrasound, performed by UltraNurses, on the clinical management of adult ICU patients	1. Impact on Management: Nurse-led thoracic ultrasound changed 26% of patient management decisions. 2. Timeliness of Changes: 96% of changes were implemented within 8 hours, ensuring rapid intervention. 3. Scope of Changes: 56% were within the nursing scope. 44% led to adjustments in fluid management. 4. Pathology Detection: 97% of cases had pathology detected, proving high diagnostic value. 5. Diagnosis Modification: 7% of cases had a diagnosis change, sometimes enabling life-saving interventions. 6. Ultrasound Frequency: Nurses performed one ultrasound per four shifts, integrating it into routine ICU care.	1. Diagnostic Reasoning and Clinical Judgment 2. Therapeutic Nursing Interventions 3. Health Promotion and Maintenance 4. Professional Nursing Practice	1. Impaired Gas Exchange 2. Ineffective Airway Clearance 3. Decreased Cardiac Output 4. Risk for Fluid Volume Deficit 5. Anxiety 6. Risk for Infection 7. Acute Pain 8. Impaired Tissue Integrity 9. Risk for Aspiration 10. Altered Nutrition: Less Than Body Requirements

Cont. Table 1. Characteristics of Included Study

Author(s), years, country	Study design, Participant(s), Aim	Key findings	Domain	Nursing Diagnoses
(Šerková and Marečková, 2019), Czech Republic	1. A descriptive design 2. 17 general nurses from the participating department of the IICU 3. To conduct content validation of selected NANDA International diagnoses for the IICU setting, and second, to identify the degree of diagnostic significance of their selected defining characteristics and relevant or risk factors	1. Validation Scores: 16 nursing diagnoses had a DCV score >0.6 (high significance). 16 diagnoses had DCV scores <0.6 (lower significance). 2. Major Characteristics: 28 major characteristics had DCV scores ≥0.80, indicating strong diagnostic accuracy. 3. Minor Characteristics: 176 minor characteristics had DCV scores between 0.79 and 0.51, with moderate relevance. 4. Insignificant Characteristics: 41 characteristics had DCV scores <0.5, indicating limited diagnostic value. 5. Recommendations: 16 NANDA-I diagnoses with 102 validated characteristics recommended for lucid adult patients in the IICU at Nový Jičín Hospital to enhance clinical decision-making.	1. Diagnostic Reasoning and Clinical Judgment 2. Health Promotion and Maintenance 3. Therapeutic Nursing Interventions 4. Professional Nursing Practice	1. Risk for Infection 2. Feeding Self-Care Deficit 3. Risk for Imbalanced Body Temperature 4. Impaired Swallowing 5. Hyperthermia 6. Bathing Self-Care Deficit 7. Constipation 8. Dressing Self-Care Deficit 9. Toileting Self-Care Deficit 10. Risk for Constipation 11. Acute Confusion 12. Excess Fluid Volume 13. Acute Pain 14. Nausea 15. Impaired Gas Exchange 16. Ineffective Airway Clearance 17. Ineffective Breathing Pattern 18. Risk for Aspiration 19. Risk for Disuse Syndrome 20. Risk for Bleeding 21. Impaired Physical Mobility 22. Risk for Peripheral Neurovascular Dysfunction 23. Impaired Bed Mobility 24. Risk for Decreased Cardiac Output 25. Risk for Pressure Ulcer 26. Risk for Perioperative Hypothermia

Cont. Table 1. Characteristics of Included Study

Author(s), years, country	Study design, Participant(s), Aim	Key findings	Domain	Nursing Diagnoses
(Araújo et al., 2023), Brazil	1. A diagnostic accuracy design with a cross-sectional analytical approach and a quantitative methodology 2. 206 adult patients admitted to an adult Intensive Care Unit 3. To analyze the clinical indicator accuracy of the nursing diagnosis proposal for ocular dryness in adult patients in the Intensive Care Unit	1. Prevalence of Ocular Dryness: 76.22% of ICU patients experienced ocular dryness, emphasizing the need for proper diagnosis and management. 2. Specificity & Sensitivity of Indicators. High specificity: Reduced tear volume (81.63%) and excessive mucous secretion (99.99%). High sensitivity: Extended blood vessels, excessive mucous secretion, mucoid filaments, and chemosis (71.97%–100.0%). 3. Optimizing Diagnosis Five key clinical indicators identified for accurate diagnosis. Enhancing diagnostic precision can improve targeted interventions and prevent complications in ICU patients.	1. Diagnostic Reasoning and Clinical Judgment 2. Health Promotion and Maintenance 3. Therapeutic Nursing Interventions 4. Professional Nursing practice	1. Ocular Dryness 2. Impaired Tear Production 3. Excessive Mucous Secretion 4. Extended Blood Vessels on the Ocular Surface 5. Mucoid Filaments 6. Chemosis
(Eren, 2023), Turkey	1. A retrospective design 2. Electronic nursing care plans of 429 patients who received treatment for COVID-19 in the intensive care units 3. To examine electronic nursing care plans for patients treated for COVID-19 in the intensive care units of a hospital	1. Nursing Diagnoses Usage. 27 nursing diagnoses used in ICU COVID-19 care. Most common: Risk for Infection, Risk for Ineffective Breathing Pattern, Risk for Impaired Oral Mucous Membrane Integrity. 2. Quality of Nursing Care Plans: 87.66% of diagnoses correctly labeled. Only 47.26% of evaluations were adequate, indicating room for improvement. 3. Quality Measurement Scores. Mean score: 51.82±6.89, suggesting above-average quality. Need for improvement in evaluating nursing interventions and outcomes. 4. Recommendations: Training needed to enhance the evaluation stage. Optimizing nursing care delivery can improve patient outcomes in ICU COVID-19 management.	1. Diagnostic Reasoning and Clinical Judgment 2. Health Promotion and Maintenance 3. Therapeutic Nursing Interventions 4. Professional Nursing practice	1. Risk for Infection 2. Risk for Ineffective Breathing Pattern 3. Risk for Impaired Oral Mucous Membrane Integrity

Cont. Table 1. Characteristics of Included Study

Author(s), years, country	Study design, Participant(s), Aim	Key findings	Domain	Nursing Diagnoses
(Ben-Tovim and Theilla, 2021), Israel	1. A descriptive exploratory design 2. 42 critical care nurses working in one intensive care unit 3. To assess the perceived and actual roles of critical care nurses in the administration of nutritional care, and second, to evaluate their knowledge regarding electrolyte monitoring, hypophosphataemia, and refeeding syndrome, including risk factors, consequences, and treatment	1. Role Perception & Knowledge Gaps: Nurses viewed dieticians as solely responsible for nutrition care. Limited knowledge on electrolyte monitoring, hypophosphatemia, and refeeding syndrome. 2. Impact on Practice: Many nurses underestimated phosphate monitoring and refeeding risks. Belief that full nutrition should start immediately, ignoring refeeding syndrome risks. 3. Knowledge-Practice Correlation: Higher knowledge linked to better adherence to nutrition guidelines. Education and training needed to improve ICU nursing practice.	1. Diagnostic Reasoning and Clinical Judgment 2. Health Promotion and Maintenance 3. Therapeutic Nursing Interventions 4. Professional Nursing practice	1. Risk for Hypophosphataemia 2. Risk for Refeeding Syndrome 3. Inadequate Nutrition Intake 4. Knowledge Deficit: Nutrition Management
(Namadi□Vosoughi et al., 2023), Iran	1. An action research design 2. 15 nurses working in the cardiology ward during the second cycle of the action research study 3. To evaluate the impact of institutionalizing the nursing process based on the TPSN model on the quality and quantity of nursing diagnoses	1. Increase in Nursing Diagnoses: Implementation of the TPSN model increased nursing diagnoses in the cardiology ward. Collaboration between healthcare centers and nursing schools positively impacted clinical practice. 2. Improved Quality of Diagnoses: Significant improvement in PES (Problem, Etiology, Signs/Symptoms) components. Enhanced comprehensive assessment and formulation of patient needs. 3. Educational & Healthcare Impact: Strengthening ties between nursing schools and hospitals improves both sectors. Full-time faculty presence in hospitals enhances evidence-based nursing care.	1. Safety and Protection 2. Coping and Stress Tolerance 3. Comfort 4. Activity and Rest 5. Nutrition 6. Self-Perception 7. Role Relationship 8. Sexuality, Life Principles, and Growth/Development	1. Risk for Falls 2. Rsik for Infection 3. Ineffective Coping 4. Stress Overload 5. Acute Pain 6. Impaired Comfort 7. Impaired Physical Mobility 8. Disturbed Sleep Pattern 9. Imbalanced Nutrition: Less Than Body Requirements 10. Risk for Imbalanced Nutrition: More Than Body Requirements 11. Disturbed Body Image 12. Low Self-Esteem 13. Impaired Social Interaction 14. Sexual Dysfunction

Cont. Table 1. Characteristics of Included Study

Author(s), years, country	Study design, Participant(s), Aim	Key findings	Domain	Nursing Diagnoses
(Cesare et al., 2023), Italy	1. A retrospective design 2. 5,027 surgical inpatients 3. To describe the prevalence and trend of nursing diagnoses in a surgical hospital setting and to analyze the relationship between nursing diagnoses and hospital outcomes	1. Prevalence & Distribution: Mean of 6.3 nursing diagnoses per patient, with a stable trend throughout the year. The safety/protection domain was the most common NANDA-I category. 2. Association with Hospital Outcomes: Longer hospital stays were linked to a higher number of nursing diagnoses on admission. More diagnoses on admission correlated with higher intra-hospital transfers and ICU admissions. 3. Clinical Significance: Nursing diagnoses play a crucial role in patient risk assessment and hospital outcome predictions in surgical settings.	1. Safety and Protection 2. Activity and Rest 3. Nutrition 4. Coping and Stress Tolerance 5. Comfort	1. Impaired Physical Mobility 2. Disturbed Sleep Pattern 3. Imbalanced Nutrition: Less Than Body Requirements 4. Ineffective Coping 5. Acute Pain 6. Impaired Comfort
(da Silva et al., 2024), Brazil	1. A quantitative approach with a descriptive and individual method 2. 57 medical records of critical care patients 3. To identify and analyze nursing diagnoses listed in the medical records of COVID-19 patients admitted to the ICU using Taxonomy II of NANDA-I	1. Standardized Nursing Diagnoses: 54.28% of diagnoses aligned with NANDA-I Taxonomy II, indicating a high level of standardization. 2. Most Frequent Diagnoses: Risk of pressure injury (66.66%). Risk of falls (64.91%). Risk of infection (45.61%). These highlight the importance of early prevention strategies in patient care. 3. Prevalence of Risk Diagnoses: Risk diagnoses dominated (among 37 mapped diagnoses). Early detection is crucial for preventing complications in ICU COVID-19 patients.	Safety and Protection	1. Risk for Developing Pressure Ulcer 2. Risk for Pressure Ulcer 3. Rsik for Falling 4. Risk for Infection

Cont. Table 1. Characteristics of Included Study

Author(s), years, country	Study design, Participant(s), Aim	Key findings	Domain	Nursing Diagnoses
(Dantas et al., 2023), Brazil	1. A diagnostic accuracy design 2. 104 adult patients hospitalized in the ICU 3. To assess the accuracy of clinical indicators for identifying ineffective airway clearance in adult ICU patients	1. Prevalence of Ineffective Airway Clearance: 36.54% of ICU patients experienced airway clearance difficulties. 2. Specificity of Clinical Indicators. High specificity indicators: Absence of cough (0.8326). Orthopnea (0.6817). Adventitious breath sounds (0.8175). Diminished breath sounds (0.8326) 3. Most Accurate Indicators: Altered respiratory rate & pattern (0.9999 sensitivity & specificity). Highly reliable for identifying ineffective airway clearance. 4. Clinical Implications: Six key indicators accurately diagnose ineffective airway clearance. Early identification aids in preventing respiratory complications in ICU patients.	Respiratory Function	1. Ineffective Airway Clearance (IAC) 2. Dyspnea 3. Ineffective Cough 4. Difficulty Verbalizing 5. Restlessness 6. Excessive Sputum 7. Wide-eyed Look
(Buyukyilmaz et al., 2020), Turkey	1. A descriptive research design 2. 121 nursing care plan records 3. To identify the nursing diagnoses frequently used in neonatal and adult ICUs and evaluate their suitability according to the NANDA-I list.	1. Neonatal ICU. Problem-focused diagnoses: Disturbed sleep pattern (85.7%). Ineffective airway clearance (60%). Ineffective breastfeeding (42.7%). Risk diagnoses: Risk for infection (100%). Risk for falls (62.9%) 2. Adult ICU. Problem-focused diagnoses: Self-care deficit (79.1%). Deficient knowledge (77.9%). Ineffective airway clearance (64.0%). Risk diagnoses: Risk for infection (87.2%). Risk for falls (79.1%) 3. Study Conclusion: Diagnoses lacked comprehensiveness in addressing patient responses. Inconsistent nursing terminology and non-compliance with NANDA-I standards.	1. Deficient Perceptual 2. Safety and Protection	1. Self-Care Deficit 2. Deficient Knowledge 3. Ineffective Airway Clearance 4. Risk for Infection 5. Risk for Falls

Note: ICU: Intensive Care Unit; COVID-19: Coronavirus Disease 2019; PDSA: Plan-Do-Study-Act; ABG: Arterial Blood Gas; TPSN: Teacher, Patient, Student, Nurse model; eRIC: electronic Record for Intensive Care; NANDA-I: North American Nursing Diagnosis Association International.

standardized table, which captured key information including author, year of publication, country, study design, population, setting, focus of nursing diagnoses, assessment methods, and major findings (Table 1). The included studies varied in design, encompassing qualitative, quantitative, and mixed-method approaches from a range of international ICU settings. A narrative synthesis was conducted to analyze and summarize the findings, focusing on the clinical application, challenges, outcomes, and implications of nursing diagnoses in intensive care. This synthesis enabled the identification of key themes, methodological trends, and gaps in the current body of knowledge.

Data Analysis

Data analysis involved a thematic analysis of the key findings extracted from the included studies. This analytical approach was chosen to systematically identify, organize, and interpret patterns of meaning across the literature. Initially, relevant data were coded line by line to capture meaningful units related to the use of nursing diagnoses in ICU settings. These codes were then reviewed and categorized into overarching themes that encapsulated the significance of nursing diagnoses, the challenges faced in their implementation, the observed patient outcomes, and their broader clinical implications. The synthesis process integrated findings from studies with diverse methodologies and geographical contexts, allowing for a comprehensive and nuanced understanding of how nursing diagnoses contribute to critical care practices. This thematic analysis provided a structured framework to highlight evidence-based insights and identify knowledge gaps that can inform future research and practice improvements in ICU nursing.

Critical Appraisal

As this was a scoping review aimed at mapping the available evidence rather than assessing the effectiveness of interventions, a formal quality assessment of included studies was not conducted. This approach is consistent with scoping review methodology guidelines, which emphasize breadth of coverage over depth of analysis.

Results

Study Selection

A total of 527 studies were identified through four electronic database searches (PubMed, CINAHL, Scopus, and WOS), following removal of duplicates. After screening titles and abstracts, 85 articles were selected for full-text review based on predetermined inclusion and exclusion criteria. Ultimately, 13 studies met the eligibility criteria and were included in the final analysis (Figure 1).

Study Characteristics

This literature review incorporates a diverse array of research designs to comprehensively examine the utilization of nursing diagnoses within intensive care units (ICUs). The selected studies encompass various methodologies, including retrospective cohort designs (Barioni et al., 2022; Cesare et al., 2023; Eren, 2023), concept analyses (Albuquerque et al., 2023), experience report methodologies (Fritzen et al., 2023), prospective observational designs (Smits et al., 2023), descriptive designs (Ben-Tovim and Theilla, 2021; Buyukyilmaz et al., 2020; da Silva et al., 2024; Šerková and Marečková, 2019), diagnostic accuracy designs (Araújo et al., 2023; Dantas et al., 2023), and action research designs (Namadi-Vosoughi et al., 2023). This comprehensive approach facilitates a multifaceted exploration of nursing diagnoses in ICU settings, considering various aspects such as clinical indicators, diagnostic accuracy, and the impact of nursing interventions (Table 1).

Furthermore, the sample characteristics of the included studies were equally diverse, representing a wide spectrum of healthcare professionals, patients, and interdisciplinary healthcare teams involved in ICU care. Lastly, the geographic distribution of the included studies was global in scope, spanning multiple countries and regions. While some studies were conducted in Brazil (Albuquerque et al., 2023; Araújo et al., 2023; Barioni et al., 2022; da Silva et al., 2024; Dantas et al., 2023; Fritzen et al., 2023), reflecting the prominence of ICU research in South America, others originated from countries such as the Netherlands (Smits et al., 2023), Czech Republic (Šerková and Marečková, 2019), Iran (Namadi-Vosoughi et al., 2023), Italy (Cesare et al., 2023), Israel (Ben-Tovim and Theilla, 2021), and Turkey (Buyukyilmaz et al., 2020; Eren, 2023). This international representation provided a comprehensive perspective on the utilization of nursing diagnoses in ICUs, considering cultural, organizational, and healthcare system differences across diverse global contexts. Collectively, the variety of study designs, sample characteristics, and countries represented in the literature review enriched the breadth and depth of the analysis, offering valuable insights into the role of nursing diagnoses in optimizing patient care within the dynamic and high-acuity environment of intensive care.

The results of the reviewed studies reveal a diverse array of nursing diagnoses utilized within intensive care units (ICUs). These diagnoses span various domains, including physiological integrity (Albuquerque et al., 2023; Barioni et al., 2022), health promotion (Albuquerque et al., 2023; Barioni et al., 2022), cognitive-perceptual (Albuquerque et al., 2023; Barioni et al., 2022), safety and protection (Albuquerque et al., 2023; Barioni et al., 2022; Buyukyilmaz et al., 2020; Cesare et al., 2023; Namadi-Vosoughi et al., 2023), information management (Fritzen et al., 2023), quality improvement (Fritzen et al., 2023), technology integration (Fritzen et al., 2023), patient-centered care (Fritzen et al., 2023), diagnostic reasoning (Araújo et al., 2023; Ben-

Tovim and Theilla, 2021; Eren, 2023; Šerková and Marečková, 2019; Smits et al., 2023), clinical judgment (Araújo et al., 2023; Ben-Tovim and Theilla, 2021; Eren, 2023; Šerková and Marečková, 2019; Smits et al., 2023), therapeutic nursing interventions (Araújo et al., 2023; Ben-Tovim and Theilla, 2021; Eren, 2023; Šerková and Marečková, 2019; Smits et al., 2023), and professional nursing practice (Araújo et al., 2023; Ben-Tovim and Theilla, 2021; Eren, 2023; Šerková and Marečková, 2019; Smits et al., 2023). Each study contributes unique insights into the identification and management of specific health concerns among critically ill patients in ICU settings. From impaired spontaneous ventilation to risk for falls, the identified nursing diagnoses provide a comprehensive framework for assessing, planning, and implementing patient-centered care.

Figure 2 shows how often different nursing domains appeared across the studies we reviewed. The domains that stood out the most were Diagnostic Reasoning and Clinical Judgment, Health Promotion and Maintenance, and Therapeutic Nursing Interventions—each mentioned in six studies. This highlights how much attention current research places on nurses' ability to make clinical decisions, support patients' ongoing health needs, and carry out effective interventions in intensive care settings. Close behind were Professional Nursing Practice and Safety and Protection, each featured in five studies. Their frequent appearance reflects the ongoing priority of upholding professional standards and ensuring patient safety in critical care. Together, these findings point to what matters most in today's nursing diagnosis research: equipping nurses with the knowledge and skills needed to navigate complex patient care environments.

Synthesis of Findings: Themes Identification

Clinical Indicators and Nursing Diagnoses

Studies such as Barioni et al. (2022) and Albuquerque et al. (2023) shed light on crucial clinical indicators and associated nursing diagnoses in critically ill patients, particularly those diagnosed with COVID-19. Barioni et al. (2022) identified dyspnea, fever, fatigue, and cough as key clinical indicators, while Albuquerque et al. (2023) explored defining attributes, antecedents, and consequences of impaired spontaneous ventilation. These findings underscored the significance of early recognition and targeted interventions to mitigate adverse outcomes in ICU patients.

Implementation Processes and Change of Management

Fritzen et al. (2023), Smits et al. (2023), and Cesare et al. (2023) examined the implementation of electronic records for perioperative nursing diagnoses, nurse-delivered thoracic ultrasound, and the prevalence and trend of nursing diagnoses in surgical settings, respectively. Fritzen et al. (2023) highlighted the iterative nature of the Plan-Do-Study-Act cycle in refining the implementation process, while Smits et al. (2023) demonstrated the substantial impact of nurse-delivered ultrasound on clinical decision-making and patient management within the ICU. Cesare et al. (2023) provided insights into the prevalence and trend of nursing diagnoses in surgical settings, emphasizing their prognostic value and association with hospital outcomes.

Diagnostic Validation and Prevalence of Specific Diagnoses

Studies such as Šerková and Marečková (2019), Araújo et al. (2023), and da Silva et al. (2024) focused on diagnostic content validation, clinical indicator accuracy, and prevalence of standardized nursing diagnoses, respectively. Šerková and Marečková (2019) provided valuable insights into the validity and prevalence of specific nursing diagnoses, emphasizing the need for standardized frameworks and accurate diagnostic inference in ICU settings. Araújo et al. (2023) identified accurate clinical indicators for specific nursing diagnoses, contributing to improved diagnostic accuracy and patient outcomes in ICU settings. da Silva et al. (2024) highlighted the prevalence of standardized nursing diagnoses, underscoring the importance of early identification and prevention strategies to enhance patient care and improve outcomes.

Impact of Interventions on Nursing Practice and Patient Outcomes

Several studies, including Eren (2023), Ben-Tovim and Theilla (2021), Namadi-Vosoughi et al. (2023), Dantas et al. (2023), and Buyukyilmaz et al. (2020), assessed the impact of interventions on nursing care delivery and patient outcomes. Eren highlighted the utilization of nursing diagnoses in electronic care plans for COVID-19 patients, while Ben-Tovim and Theilla (2021) underscored the correlation between nurses' knowledge levels and their actual practice in nutritional care. Namadi-Vosoughi et al. (2023) emphasized the importance of institutionalizing the nursing process to enhance the quantity and quality of nursing diagnoses, thereby improving patient care and fostering collaboration between academia and clinical practice. Dantas et al. (2023) identified accurate clinical indicators for specific nursing diagnoses, contributing to improved diagnostic accuracy and patient outcomes in ICU settings. Buyukyilmaz et al. (2020) examined nursing diagnoses frequently used in neonatal and adult ICUs, highlighting the need for standardization and suitability assessment according to NANDA-I terminology.

Discussion

The findings from the reviewed studies provide valuable insights of nursing diagnoses in intensive care unit (ICU) settings. Studies Barioni et al. (2022) and Albuquerque et al. (2023) underscore the

importance of recognizing key clinical indicators, such as dyspnea and impaired ventilation, in critically ill patients, particularly those diagnosed with COVID-19. These indicators serve as essential cues for timely interventions aimed at mitigating adverse outcomes and improving patient survival rates (Hidayati et al., 2022). Additionally, the implementation of electronic records for perioperative nursing diagnoses and nurse-delivered thoracic ultrasound, as demonstrated by Fritzen et al. (2023), Smits et al. (2023), and Cesare et al. (2023), has shown promising results in enhancing nursing care delivery and clinical decision-making within the ICU. The electronic Record for Intensive Care (eRIC) is an ICU information system designed to collect and integrate patient data from multiple sources every minute. The introduction of eRIC led to the creation of an additional patient record, raising concerns about its potential impact on workflow and patient safety (Li et al., 2024). Moreover, studies focusing on diagnostic validation and prevalence of specific diagnoses, such as Šerková and Marečková (2019), Araújo et al. (2023), and da Silva et al. (2024), highlight the importance of standardized frameworks and accurate diagnostic inference in improving patient care and outcomes. The prior study findings underscored the importance of standardized nursing language in pre-hospital care and highlighted the need for individualized and standardized care plans tailored to the unique needs of patients in this setting (Romero-Sánchez et al., 2024). Lastly, interventions aimed at improving nursing care delivery, as explored by Eren (2023), Ben-Tovim and Theilla (2021), Namadi-Vosoughi et al. (2023), Dantas et al. (2023), and Buyukyilmaz et al. (2020), have demonstrated significant impacts on nursing practice and patient outcomes, emphasizing the need for ongoing education, standardization, and collaboration in ICU settings (Pu et al., 2024).

Significance of Nursing Diagnoses in ICU Settings

The findings of this literature review underscore the critical role of nursing diagnoses in guiding patient care within intensive care units (ICUs). Across included studies, nursing diagnoses were consistently recognized for their contribution to comprehensive patient assessment, individualized care planning, and interdisciplinary collaboration. By providing a structured framework for clinical decision-making, nursing diagnoses facilitate early detection of health problems, prioritize interventions, and promote patient safety and quality of care delivery. Professional nursing organizations advocate for the use of nursing diagnosis as a means to enhance and standardize care practices, as well as to establish a common language among nursing practitioner (Cachón-Pérez et al., 2021; Šerková and Marečková, 2019). By recognizing and addressing the complexities of ICU practice, healthcare organizations can empower nurses to effectively integrate nursing diagnosis into their clinical decision-making processes, ultimately enhancing the delivery of care services (Cachón-Pérez et al., 2021).

Impact on Patient Outcomes

Evidence from empirical studies suggests a positive association between the use of nursing diagnoses and improved patient outcomes in ICUs. Reductions in adverse events, complications, and hospital readmissions were reported, alongside enhancements in patient satisfaction and quality of life (Cesare et al., 2023). These findings underscore the clinical significance of nursing diagnoses in optimizing patient care and highlight their potential to drive positive outcomes in the critical care setting.

Implications for Nursing Practice

The results of this review have several implications for practice, policy, and future research in ICU settings. Practically, healthcare providers can use the identified clinical indicators and nursing diagnoses to guide assessment, intervention, and evaluation processes, thereby improving the quality of care and patient outcomes. Policy-wise, healthcare organizations may consider implementing standardized frameworks and electronic record systems to support nursing diagnosis documentation and decision-making. For future research, there is a need for well-designed prospective studies with larger sample sizes to further explore the effectiveness of interventions and validate nursing diagnoses in diverse ICU populations. Additionally, longitudinal studies assessing the long-term impact of nursing interventions on patient outcomes could provide valuable insights into the sustainability and scalability of nursing practices in ICU settings.

Limitations

The reviewed studies offer valuable insights, but limitations exist. Small sample sizes and specific inclusion criteria may limit generalizability, while retrospective designs could introduce biases. Heterogeneity in study designs and populations poses challenges in drawing definitive conclusions. The review process may have limitations, including potential publication bias and language restrictions, impacting the comprehensiveness of evidence capture. Further research with larger samples and prospective designs is needed to address these limitations and enhance the robustness of findings in ICU settings.

Conclusions

This review highlights the pivotal role of nursing diagnoses in ICU settings, supported by diverse methodologies and global representation. Clinical indicators aid in timely interventions, particularly for COVID-19 patients. Interventions like electronic records and thoracic ultrasound enhance care delivery. Challenges include terminology variability and documentation burden. Evidence suggests a

positive correlation between nursing diagnoses and improved patient outcomes, urging their integration into practice and policy. Future research should prioritize prospective studies with larger samples to address limitations and strengthen evidence in ICU settings.

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