

From Knowledge to Practice: Understanding Competency Challenges in Nursing

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Abstract: *Nursing competency is a fundamental determinant of safe, effective, and high-quality healthcare delivery; however, a persistent gap remains between theoretical knowledge and its application in clinical practice. This review examines contemporary challenges affecting nursing competency development and the factors influencing knowledge translation into professional practice. Evidence indicates that nursing competency is a multidimensional construct encompassing clinical knowledge, technical skills, critical thinking, communication, leadership, professional judgment, and technological proficiency. Key challenges include limited clinical learning opportunities, inconsistent competency assessment, workforce shortages, organizational constraints, and the increasing complexity of healthcare systems. The findings highlight competency-based education, simulation-based learning, mentorship, quality and safety initiatives, and continuing professional development as important strategies for strengthening practice readiness. Emerging technologies, including digital health systems, telehealth, and artificial intelligence, are also reshaping competency expectations and creating new educational requirements. Competency development should therefore be understood as a dynamic, lifelong process requiring continuous learning, adaptation, and institutional support. Bridging the knowledge-practice gap requires coordinated efforts among educational institutions, healthcare organizations, professional bodies, and policymakers to foster supportive clinical environments and prepare resilient, adaptable, and practice-ready nurses capable of delivering safe, evidence-based, patient-centered care across increasingly complex healthcare environments.*

Keywords: Nursing Competency; Clinical Competence; Knowledge-Practice Gap; Competency-Based Education; Nursing Education; Professional Development; Patient Safety.

1. Introduction

Nursing competency is widely recognized as a fundamental component of safe, effective, and high-quality healthcare delivery. As healthcare systems continue to evolve in response to demographic changes, technological advancements, increasing disease complexity, and rising patient expectations, nurses are required to demonstrate a broad range of competencies that extend beyond traditional clinical skills. Contemporary nursing practice demands the integration of scientific knowledge, clinical judgment, critical thinking, communication abilities, leadership skills, ethical decision-making, and evidence-based practice to ensure optimal patient outcomes (Notarnicola et al., 2025). Competency in nursing is generally understood as the ability to effectively apply knowledge, skills,

attitudes, and professional values within specific clinical contexts. The concept has gained increasing attention over the past decade because of its direct association with patient safety, quality of care, healthcare efficiency, and professional accountability. Consequently, nursing education institutions and healthcare organizations worldwide have shifted toward competency-based frameworks designed to better prepare nurses for the complex realities of modern healthcare environments (Lewis et al., 2022; AACN, 2021).

Despite significant advancements in nursing education, concerns persist regarding the preparedness of nursing graduates to transition successfully from academic learning environments into clinical practice. Numerous studies have highlighted the existence of a persistent "knowledge-to-practice gap," referring to the discrepancy between theoretical knowledge acquired during nursing education and its effective application in real-world healthcare settings. This gap may negatively affect clinical decision-making, confidence, professional performance, and ultimately patient outcomes (Kavanagh, 2021). Several factors contribute to this challenge. Educational programs may struggle to provide sufficient opportunities for experiential learning and competency assessment, while healthcare organizations often face workforce shortages, increased patient acuity, and limited resources for mentorship and professional development. Furthermore, newly graduated nurses frequently encounter difficulties adapting theoretical concepts to dynamic clinical situations that require rapid decision-making and interdisciplinary collaboration (Nagai et al., 2024). These challenges have intensified as healthcare systems increasingly rely on digital technologies, electronic health records, telehealth services, and emerging artificial intelligence applications, all of which require additional competencies beyond traditional nursing preparation (Atkins et al., 2025).

Recognizing these challenges, several international organizations have introduced competency frameworks to guide nursing education and practice. The American Association of Colleges of Nursing (AACN) developed the revised Essentials framework, emphasizing competency-based education and measurable professional outcomes across nursing programs (AACN, 2021). Similarly, the Quality and Safety Education for Nurses (QSEN) initiative has promoted competencies related to patient-centered care, teamwork and collaboration, evidence-based practice, quality improvement, safety, and informatics as essential components of professional nursing practice (AlRatrou et al., 2025; Ferro & Yoder, 2024). These frameworks seek to bridge the gap between academic preparation and clinical performance by ensuring that graduates possess the competencies necessary for contemporary healthcare environments.

Recent literature indicates that competency-based education (CBE) has emerged as a promising approach to addressing many of the limitations of traditional educational models. Unlike time-based educational systems, competency-based approaches focus on demonstrated achievement of specific competencies and measurable learning outcomes. Studies have shown that competency-based curricula can enhance clinical readiness, strengthen professional confidence, and improve the alignment between educational preparation and workplace expectations (Lewis et al., 2022; Mani, 2025). Nevertheless, the implementation of competency-based education remains associated with challenges related to curriculum redesign, assessment methods, faculty preparation, and institutional resources. Given the growing emphasis on competency development and the ongoing challenges associated with translating knowledge into clinical practice, a comprehensive understanding of competency-related barriers and facilitators is essential. Exploring these challenges can provide valuable insights for educators, healthcare leaders, policymakers, and nursing professionals seeking to strengthen workforce readiness and improve patient care outcomes.

Therefore, this review aims to examine the current evidence regarding nursing competency challenges, explore factors contributing to the knowledge-to-practice gap, and identify strategies that

support the development and maintenance of competency in contemporary nursing practice. By synthesizing recent literature, this review seeks to contribute to ongoing efforts to enhance nursing education, strengthen clinical performance, and promote the delivery of safe, effective, and evidence-based healthcare.

1.1 Review Methodology

This paper employed a narrative review approach to examine contemporary evidence related to nursing competency development and the challenges associated with translating theoretical knowledge into clinical practice. A comprehensive review of the literature was conducted to identify current concepts, challenges, influencing factors, and strategies related to nursing competency in modern healthcare environments. Relevant literature published between 2021 and 2025 was reviewed to ensure the inclusion of recent evidence reflecting contemporary developments in nursing education and practice. Sources were selected from peer-reviewed journals focusing on nursing education, professional competency, quality and safety, competency-based education, and workforce preparedness. Particular attention was given to studies addressing the knowledge–practice gap, competency development, quality and safety competencies, competency-based education frameworks, and emerging competency requirements associated with technological innovation and evolving healthcare systems.

The review included a range of evidence sources, such as systematic reviews, scoping reviews, qualitative studies, educational reviews, professional analyses, and intervention studies. Articles were selected based on their relevance to the objectives of the review and their contribution to understanding competency challenges in nursing. Studies focusing exclusively on non-nursing healthcare professions or those not directly related to competency development were excluded. The selected literature was analyzed thematically. Key findings were organized into major themes, including the conceptualization of nursing competency, the knowledge–practice gap, competency challenges in contemporary nursing practice, factors influencing competency development, strategies for strengthening competency, and future directions in nursing education and professional practice. The synthesis of these themes provided the foundation for the discussion and conclusions presented in this review.

1.2 Understanding Nursing Competency

Nursing competency is a multifaceted concept that has become central to nursing education, professional practice, and healthcare quality improvement initiatives. As healthcare systems continue to evolve in response to demographic shifts, technological innovations, and increasing patient complexity, the expectations placed upon nurses have expanded considerably. Consequently, nursing competency is no longer viewed solely as the ability to perform clinical procedures; rather, it encompasses the integration of knowledge, technical skills, critical thinking, professional attitudes, ethical values, communication abilities, and clinical judgment required to provide safe and effective patient care (Notarnicola et al., 2025). Although no single universally accepted definition exists, nursing competency is generally described as the effective application of knowledge, skills, and professional behaviors within specific clinical contexts. Contemporary competency frameworks emphasize that competence involves not only what nurses know but also how they apply their knowledge to complex and dynamic healthcare situations. This perspective reflects a shift from task-oriented models of nursing toward outcome-oriented approaches that prioritize patient safety, quality of care, and evidence-based decision-making (Lewis et al., 2022).

The growing emphasis on competency has led to the development of several international frameworks designed to guide nursing education and professional practice. Among the most influential is the American Association of Colleges of Nursing (AACN) Essentials framework, which identifies core competencies required for professional nursing practice across various educational levels. The framework promotes competency-based education and emphasizes domains such as person-centered care, population health, scholarship for nursing practice, interprofessional partnerships, systems-based practice, informatics, and professional identity (AACN, 2021). Similarly, the Quality and Safety Education for Nurses (QSEN) initiative highlights six essential competencies, including patient-centered care, teamwork and collaboration, evidence-based practice, quality improvement, safety, and informatics, all of which are considered fundamental for contemporary nursing practice (AlRatrout et al., 2025; Ferro & Yoder, 2024).

Current literature suggests that nursing competency can be understood through several interconnected dimensions. Knowledge competency refers to the acquisition and application of scientific, theoretical, and clinical knowledge necessary for evidence-based practice. Clinical competency involves the ability to perform technical procedures safely and effectively while adapting interventions to individual patient needs. Cognitive competency encompasses critical thinking, clinical reasoning, and decision-making processes that support appropriate clinical judgments. Additionally, interpersonal competency includes communication, teamwork, cultural sensitivity, and collaboration with patients, families, and multidisciplinary healthcare teams. Professional and ethical competency reflects accountability, leadership, advocacy, and adherence to professional standards and ethical principles (Jackson, 2024).

The relationship between competency and patient outcomes has been consistently highlighted in nursing research. Higher levels of nursing competency have been associated with improved patient safety, reduced clinical errors, enhanced quality of care, greater patient satisfaction, and more effective healthcare delivery. Conversely, deficiencies in competency may contribute to adverse patient outcomes, reduced confidence among nurses, increased workplace stress, and challenges in adapting to complex clinical environments (Kavanagh, 2021). Recent developments in healthcare have further expanded the concept of competency to include digital literacy, informatics, simulation-based learning, telehealth utilization, and the ability to engage with emerging technologies such as artificial intelligence. These emerging competencies reflect the evolving nature of healthcare delivery and underscore the importance of continuous professional development throughout a nurse's career (Atkins et al., 2025). Therefore, nursing competency should be viewed as a dynamic and continuously evolving construct rather than a static achievement. Developing and maintaining competency requires ongoing learning, clinical experience, mentorship, and organizational support. Understanding the dimensions and significance of nursing competency provides the foundation for examining the challenges that hinder the successful translation of knowledge into clinical practice.

1.3 The Knowledge–Practice Gap in Nursing

One of the most persistent challenges in nursing education and healthcare practice is the gap between theoretical knowledge and its application in clinical settings. Commonly referred to as the knowledge–practice gap, this phenomenon describes the discrepancy between what nurses learn during their academic preparation and what they are able to implement effectively in real-world patient care situations. Despite continuous improvements in nursing curricula, the translation of knowledge into competent clinical performance remains a significant concern across healthcare systems worldwide (Kavanagh, 2021). Kavanagh (2021) argued that the nursing profession is facing a critical moment regarding competency development, emphasizing that educational achievement

alone does not guarantee clinical competence. According to the author, many nursing graduates demonstrate adequate theoretical understanding but encounter difficulties when applying that knowledge in complex healthcare environments characterized by uncertainty, rapid decision-making, and competing clinical priorities. This challenge highlights the need to move beyond knowledge acquisition toward the development of measurable competencies that can be consistently demonstrated in practice.

The transition from traditional educational approaches to competency-based education has been proposed as a strategy for narrowing the knowledge–practice gap. Lewis et al. (2022) emphasized that competency-based education focuses on outcomes rather than instructional time, ensuring that learners demonstrate mastery of specific competencies before progressing. This approach aims to align educational experiences more closely with clinical expectations and workforce requirements. By emphasizing observable performance and continuous assessment, competency-based education seeks to improve graduates' readiness for professional practice. Evidence from clinical settings further illustrates the complexity of translating knowledge into practice. Nagai et al. (2024) examined the experiences of nurses educated through competency-based and objective-based educational models and found that competency-based preparation was associated with stronger clinical decision-making abilities and greater confidence in patient care activities. However, the study also highlighted that competency development remains influenced by workplace conditions, mentorship opportunities, and access to ongoing professional support after graduation.

Educational institutions are not the sole contributors to the knowledge–practice gap. Organizational and environmental factors also play a substantial role in determining whether nurses can effectively utilize their knowledge in practice. Heavy workloads, staffing shortages, limited supervision, and high patient acuity can reduce opportunities for reflective learning and competency development. In such environments, newly graduated nurses may struggle to integrate theoretical concepts into clinical decision-making processes, increasing stress and potentially affecting the quality of care provided. The increasing complexity of healthcare delivery has further widened the demands placed on nurses. Modern practitioners are expected to integrate evidence-based practice, digital technologies, quality improvement principles, interprofessional collaboration, and patient-centered care into their daily activities. Atkins et al. (2025) noted that contemporary healthcare environments require competencies that extend beyond traditional clinical skills, including technological literacy, simulation-based learning experiences, and the ability to engage with emerging artificial intelligence tools. These evolving expectations create additional challenges for nurses attempting to translate educational preparation into effective clinical performance.

Another important contributor to the knowledge–practice gap is the variability in competency assessment methods. Mani (2025) reported that many nursing programs continue to face challenges in evaluating competency consistently across academic and clinical settings. Differences in assessment standards, curriculum design, and faculty preparation may lead to inconsistencies in determining whether graduates are truly prepared for practice. Consequently, some nurses may enter the workforce with varying levels of competence despite completing similar educational requirements. Overall, the knowledge–practice gap represents a multifactorial challenge influenced by educational approaches, clinical environments, organizational support, and evolving healthcare expectations. Understanding the factors that contribute to this gap is essential for developing targeted interventions that strengthen nursing competency and improve the successful transition from knowledge acquisition to professional practice.

1.4 Competency Challenges in Contemporary Nursing Practice

Contemporary nursing practice is characterized by increasing complexity, requiring nurses to integrate theoretical knowledge, clinical skills, professional judgment, and evidence-based decision-making in rapidly changing healthcare environments. Although competency has become a central objective of nursing education and workforce development, numerous challenges continue to affect nurses' ability to perform effectively and consistently in clinical settings. One of the most significant challenges involves clinical decision-making. Nurses are frequently required to assess patient conditions, prioritize interventions, and respond to unexpected clinical situations. While academic programs provide a strong theoretical foundation, translating that knowledge into real-time clinical judgments can be difficult, particularly for newly graduated nurses. Nagai et al. (2024) reported that competency development requires not only knowledge acquisition but also the ability to apply that knowledge appropriately within complex clinical environments. Limited exposure to diverse clinical situations may therefore hinder confidence and decision-making abilities.

Another major challenge relates to the implementation of competency-based education. Although competency-based frameworks have been widely promoted as a solution to workforce readiness concerns, educational institutions continue to face difficulties in curriculum redesign, competency assessment, and faculty preparation. Lewis et al. (2022) emphasized that competency-based education requires substantial structural changes to ensure that learning outcomes are measurable and directly linked to professional practice. Inconsistent implementation may result in variations in graduate preparedness and competency achievement. Patient safety and quality improvement also represent critical competency challenges within modern healthcare systems. Nurses are expected to deliver safe care while adhering to quality standards and evidence-based guidelines. However, maintaining competency in these areas requires continuous education, practical reinforcement, and organizational support. AlRatrout et al. (2025) demonstrated that educational interventions based on the QSEN framework can improve nurses' knowledge, skills, and attitudes related to quality and safety. Nevertheless, sustaining these competencies in everyday clinical practice remains an ongoing challenge.

Technological advancements have introduced additional competency requirements for nurses. The increasing use of electronic health records, telehealth services, simulation technologies, and artificial intelligence has transformed healthcare delivery. According to Atkins et al. (2025), future nursing practice will depend heavily on the ability of nurses to adapt to digital innovations while maintaining patient-centered care. Differences in technological literacy and access to training opportunities may create competency gaps that affect professional performance and healthcare outcomes. Communication and collaboration challenges also influence nursing competency. Effective patient care depends on successful interactions among nurses, patients, families, and multidisciplinary healthcare teams. The AACN Essentials framework identifies interprofessional collaboration as a fundamental competency required for professional nursing practice. However, communication barriers, workplace pressures, and organizational cultures may limit effective teamwork and negatively affect both patient outcomes and professional performance.

Furthermore, competency development is influenced by the expectation of lifelong learning. As healthcare knowledge continues to expand, nurses must continuously update their clinical knowledge and professional skills. Jackson (2024) highlighted that competency should be viewed as a dynamic process requiring ongoing professional growth rather than a fixed achievement attained upon graduation. However, workload demands, staffing shortages, and limited professional development opportunities may restrict nurses' ability to engage in continuous learning activities. Collectively, these challenges demonstrate that nursing competency is shaped by multiple interconnected factors

operating at educational, professional, and organizational levels. Addressing these barriers is essential for strengthening workforce readiness, supporting professional development, and improving the translation of knowledge into safe and effective clinical practice.

1.5 Factors Influencing Nursing Competency Development

The development of nursing competency is a continuous and dynamic process influenced by multiple educational, professional, and organizational factors. Competency is not acquired solely through academic preparation but evolves through the interaction of knowledge, clinical experience, workplace support, and ongoing professional development. Understanding these influencing factors is essential for addressing competency gaps and promoting effective nursing practice. Educational preparation remains one of the most important determinants of competency development. Nursing education provides the theoretical foundation upon which professional practice is built. However, the effectiveness of educational programs depends not only on the content delivered but also on the extent to which learning experiences facilitate the application of knowledge in clinical settings. Lewis et al. (2022) emphasized that competency-based education strengthens the alignment between educational outcomes and professional expectations by focusing on demonstrated performance rather than completion of instructional requirements. Such approaches can enhance learners' readiness to enter increasingly complex healthcare environments.

Clinical experience also plays a critical role in competency development. While theoretical knowledge provides the basis for professional practice, practical experience allows nurses to refine their clinical judgment, improve technical skills, and develop confidence in decision-making. Nagai et al. (2024) found that nurses educated within competency-based frameworks demonstrated stronger abilities to apply knowledge in practice when supported by meaningful clinical experiences. Exposure to diverse patient populations and clinical situations contributes significantly to the development of professional competence. Mentorship and professional support further influence competency growth throughout a nurse's career. Newly graduated nurses often face challenges when transitioning from academic environments to clinical practice. Guidance from experienced practitioners can facilitate this transition by promoting knowledge integration, reflective practice, and professional confidence. Supportive learning environments encourage nurses to seek feedback, discuss clinical challenges, and continuously improve their performance.

Organizational factors are equally important in shaping nursing competency. Healthcare institutions that promote continuing education, professional development, and evidence-based practice create conditions that support competency maintenance and advancement. Conversely, staffing shortages, excessive workloads, and limited educational opportunities may hinder competency development and reduce opportunities for learning. Kavanagh (2021) argued that competency should be viewed as a shared responsibility between educational institutions and healthcare organizations, emphasizing the need for supportive systems that facilitate ongoing professional growth. The integration of quality and safety principles within healthcare organizations also contributes to competency development. AlRatrout et al. (2025) demonstrated that structured educational initiatives focused on quality and safety competencies can significantly improve nurses' professional knowledge, skills, and attitudes. Such initiatives reinforce the practical application of competency frameworks and support the delivery of high-quality patient care.

Technological advancement has emerged as another influential factor in competency development. Modern healthcare environments increasingly rely on digital systems, telehealth platforms, electronic health records, and emerging artificial intelligence applications. Atkins et al. (2025) highlighted the

growing importance of technological literacy and adaptability as essential competencies for the future nursing workforce. Nurses who receive adequate training and organizational support are better positioned to integrate these technologies into clinical practice effectively. Finally, lifelong learning is fundamental to maintaining and enhancing competency over time. The continuous expansion of healthcare knowledge, evolving clinical guidelines, and changing patient needs require nurses to engage in ongoing professional development. Competency should therefore be regarded as an evolving process that requires continuous learning, self-reflection, and adaptation throughout professional practice. Sustained commitment to professional growth enables nurses to remain competent in increasingly complex healthcare environments and supports the delivery of safe, effective, and evidence-based care.

1.6 Strategies for Bridging the Knowledge–Practice Gap

Bridging the gap between theoretical knowledge and clinical practice has become a major priority for nursing educators, healthcare organizations, and policymakers. As healthcare systems become increasingly complex, effective strategies are needed to ensure that nurses can successfully apply acquired knowledge in diverse clinical situations. The literature suggests that strengthening nursing competency requires a combination of educational innovation, clinical support, continuous professional development, and organizational commitment. One of the most widely adopted approaches is competency-based education. This educational model emphasizes the achievement of measurable competencies rather than the completion of predetermined instructional hours. Lewis et al. (2022) highlighted that competency-based education promotes active learning, continuous assessment, and demonstration of clinical performance, thereby improving the alignment between educational preparation and professional practice requirements. By focusing on observable outcomes, this approach helps ensure that nursing graduates possess the competencies necessary for safe and effective patient care.

Curriculum redesign has also been identified as an important strategy for improving competency development. Traditional curricula often emphasize knowledge acquisition, whereas contemporary healthcare environments require the integration of knowledge, skills, attitudes, and clinical judgment. Mani (2025) emphasized that curriculum revision should incorporate competency frameworks, practice-based learning experiences, and assessment methods that reflect real-world clinical expectations. Such reforms can facilitate a smoother transition from academic learning to professional practice. Simulation-based learning represents another effective strategy for reducing the knowledge–practice gap. Simulated clinical experiences provide learners with opportunities to apply theoretical concepts, develop decision-making skills, and practice clinical interventions in safe and controlled environments. Through repeated exposure to realistic scenarios, nursing students can strengthen clinical reasoning and build confidence before entering actual healthcare settings. Simulation has become particularly valuable in situations where access to clinical placements may be limited or where exposure to high-risk clinical situations is difficult to obtain.

Structured transition-to-practice programs also contribute significantly to competency development. Newly graduated nurses frequently experience challenges when adapting to professional responsibilities and complex clinical environments. Mentorship, preceptorship, and residency programs provide guidance, feedback, and professional support during this critical period. These programs facilitate knowledge integration, enhance confidence, and promote the development of clinical competence through supervised practice and reflective learning. The promotion of quality and safety education is another important strategy for strengthening nursing competency. AlRatrou et al. (2025) demonstrated that educational interventions based on quality and safety competencies

can improve nurses' knowledge, skills, and professional attitudes. Integrating quality improvement principles and patient safety concepts into both educational programs and workplace training can enhance nurses' ability to deliver safe and evidence-based care.

Continuous professional development remains essential for maintaining competency throughout a nurse's career. Healthcare knowledge, clinical guidelines, and technological innovations continue to evolve rapidly, making lifelong learning a professional necessity. Jackson (2024) emphasized that competency should be viewed as a developmental process that requires ongoing education, self-assessment, and professional engagement. Opportunities for continuing education enable nurses to update their competencies and respond effectively to emerging healthcare challenges. In addition, healthcare organizations play a crucial role in supporting competency development. Supportive leadership, access to educational resources, collaborative work environments, and a culture that values learning can facilitate the continuous improvement of professional practice. Organizations that invest in workforce development are better positioned to foster competency growth and improve patient outcomes. Collectively, these strategies demonstrate that bridging the knowledge–practice gap requires coordinated efforts across educational institutions, healthcare organizations, and individual professionals. By strengthening competency-based education, expanding experiential learning opportunities, supporting professional transitions, and promoting lifelong learning, nursing leaders can enhance workforce readiness and improve the quality and safety of healthcare delivery.

1.7 Future Directions in Nursing Competency

The future of nursing competency will be shaped by ongoing transformations in healthcare delivery, technological innovation, demographic changes, and evolving patient needs. As healthcare systems become increasingly complex, nurses will be expected to demonstrate competencies that extend beyond traditional clinical skills and encompass broader domains of leadership, technology, collaboration, and systems thinking. A significant area of future competency development involves digital health and technological proficiency. The widespread adoption of electronic health records, telehealth services, digital monitoring systems, and data-driven healthcare models has fundamentally changed nursing practice. Atkins et al. (2025) emphasized that future nursing professionals must possess the knowledge and skills necessary to effectively utilize emerging technologies while maintaining safe, patient-centered care. Digital literacy is therefore expected to become an essential component of professional competency across all healthcare settings.

Artificial intelligence is also anticipated to play an increasingly important role in nursing practice. AI-supported clinical decision systems, predictive analytics, and automated documentation tools have the potential to improve healthcare efficiency and patient outcomes. However, the successful integration of these technologies requires nurses to develop competencies related to data interpretation, technological evaluation, ethical decision-making, and human–technology interaction. As AI becomes more integrated into healthcare systems, nursing education programs will need to incorporate relevant training to prepare future practitioners for technology-enhanced practice environments. Another important direction involves strengthening competency-based education models. Educational institutions are increasingly moving away from traditional time-based learning approaches toward outcome-focused frameworks that emphasize demonstrated achievement of professional competencies. Mani (2025) highlighted the growing importance of curriculum redesign strategies that align educational preparation with contemporary healthcare demands. Future educational reforms are likely to place greater emphasis on competency assessment, experiential learning, and the continuous evaluation of practice readiness.

The increasing complexity of healthcare systems will also require nurses to develop stronger leadership and interprofessional collaboration competencies. Healthcare delivery depends on effective teamwork among diverse professionals, and nurses are frequently expected to coordinate care, advocate for patients, and contribute to organizational improvement initiatives. The AACN Essentials framework recognizes leadership, systems-based practice, and interprofessional partnership as critical competencies for the future nursing workforce. Developing these competencies will be essential for addressing emerging healthcare challenges and improving patient outcomes. Global health challenges, including population aging, the growing prevalence of chronic diseases, and workforce shortages, will further influence future competency requirements. Notarnicola et al. (2025) argued that nursing competencies must continuously evolve in response to changing healthcare needs and demographic trends. Future nurses will require greater adaptability, cultural competence, population health knowledge, and the ability to provide care across diverse healthcare contexts.

Continuous professional development is expected to remain a cornerstone of competency maintenance and advancement. Given the rapid expansion of healthcare knowledge and innovation, competency can no longer be viewed as a fixed achievement attained at graduation. Instead, professional competence must be continuously updated through lifelong learning, reflective practice, and engagement with emerging evidence. Healthcare organizations and educational institutions will therefore play an increasingly important role in supporting sustainable competency development throughout nurses' careers. Overall, the evidence reviewed highlights the evolving nature of nursing competency and the growing importance of educational innovation, technological adaptation, and lifelong professional development. To provide a concise overview of the studies that informed this review, Table 1 summarizes the characteristics and key findings of the included literature.

Table 1. Summary of Reviewed Studies

Author(s)	Year	Study Design	Focus of Study	Key Findings
Kavanagh	2021	Conceptual Analysis	Competency crisis in nursing education	Theoretical knowledge alone does not guarantee clinical competence; competency must be demonstrated in practice.
Lewis et al.	2022	Educational Review	Competency-based education (CBE) in nursing	CBE improves alignment between educational outcomes and professional practice requirements through measurable competencies.
Dugan & Altmiller	2023	Educational Case-Based Analysis	Application of AACN Essentials in nurse practitioner education	Authentic clinical learning experiences support competency achievement and practice readiness.
Ferro & Yoder	2024	Scoping Review	Graduate nurses' education and use of QSEN competencies	QSEN competencies strengthen preparedness for quality improvement, patient safety, and evidence-based practice.
Jackson	2024	Professional Review	Revised AACN Essentials and competency development	Nursing competency should be viewed as a lifelong developmental process requiring continuous professional growth.

Author(s)	Year	Study Design	Focus of Study	Key Findings
Nagai et al.	2024	Qualitative Study	Competency-based versus objective-based nursing education	Nurses trained through competency-based approaches demonstrated stronger confidence and clinical decision-making abilities.
Moore et al.	2024	Program Development Study	Development of a competency-based MSN program	Innovative curriculum design can improve practice readiness and support competency achievement.
Dioso & Naveed	2024	Systematic Review and Meta-analysis	QSEN competency interventions in nursing education	QSEN-based interventions improve nursing knowledge, skills, and professional attitudes.
Notarnicola et al.	2025	Systematic Review	Nursing competencies in evolving healthcare systems	Nursing competencies must continuously evolve to address demographic, technological, and healthcare system changes.
Mani	2025	Scoping Review	Transitioning to competency-based nursing education	Curriculum redesign, competency assessment, and faculty development are essential for successful CBE implementation.
AlRatrout et al.	2025	Intervention Study	Impact of QSEN educational program on junior nurses	QSEN education significantly improves quality and safety-related competencies.
Atkins et al.	2025	Review Article	Future nursing education and workforce preparation	Artificial intelligence, simulation, and competency-based learning are key drivers of future nursing competency development.
Welch	2025	Conceptual/Professional Review	Competence-to-expertise progression in nursing	Competency development is a gradual process that progresses through experience, reflection, and continuous learning.

AACN = American Association of Colleges of Nursing; **CBE** = Competency-Based Education; **QSEN** = Quality and Safety Education for Nurses; **MSN** = Master of Science in Nursing.

2. Discussion

This review examined the challenges associated with nursing competency development and the ongoing difficulties involved in translating theoretical knowledge into effective clinical practice. The reviewed literature consistently demonstrates that nursing competency has evolved into a multidimensional construct encompassing knowledge, clinical skills, critical thinking, professional judgment, communication, leadership, and the ability to adapt to rapidly changing healthcare environments. As healthcare systems continue to become more complex, the expectations placed

upon nurses have expanded considerably, making competency development an increasingly important priority for nursing education and healthcare organizations (Notarnicola et al., 2025). One of the most significant findings emerging from the literature is the persistence of the knowledge–practice gap. Although nursing curricula provide students with substantial theoretical knowledge, translating that knowledge into safe and effective clinical practice remains a challenge for many practitioners. Kavanagh (2021) described this issue as a defining challenge in contemporary nursing education, arguing that the traditional assumption that knowledge acquisition naturally leads to competence is no longer sufficient. Modern healthcare environments require nurses to apply knowledge under conditions characterized by uncertainty, high patient acuity, time pressure, and rapidly changing clinical circumstances. Consequently, the ability to transfer theoretical understanding into practical decision-making has become a central determinant of professional competency.

The findings of this review suggest that competency development should be viewed as a progressive process rather than a single educational outcome. Competence is acquired through the continuous interaction between academic preparation and clinical experience. This perspective is supported by Nagai et al. (2024), who found that nurses educated through competency-based approaches demonstrated stronger confidence and greater ability to apply knowledge in clinical settings compared with those educated through more traditional objective-based models. Their findings highlight the importance of experiential learning opportunities that allow learners to integrate knowledge, clinical reasoning, and practical skills within authentic healthcare environments. The increasing adoption of competency-based education represents one of the most important developments in contemporary nursing education. Lewis et al. (2022) argued that competency-based education shifts the focus from educational processes to measurable outcomes, ensuring that learners demonstrate mastery of specific competencies before progression. Similarly, Dugan and Altmiller (2023) emphasized that competency-based frameworks aligned with the AACN Essentials provide opportunities for learners to engage in authentic clinical situations that reflect the realities of professional nursing practice. These approaches seek to reduce the disconnect between educational preparation and workplace expectations by emphasizing performance, accountability, and practice readiness.

Despite these potential benefits, the literature indicates that implementing competency-based education remains challenging. Mani (2025) reported that many nursing programs continue to experience difficulties related to curriculum redesign, faculty preparation, competency assessment, and resource allocation. Educational institutions often struggle to establish consistent competency standards and valid assessment methods capable of accurately measuring professional readiness. As a result, variability in implementation may contribute to differences in graduate competency outcomes across institutions. These findings suggest that educational reform alone is insufficient unless accompanied by systematic support, faculty development, and robust evaluation mechanisms. Another important observation emerging from the reviewed studies concerns the influence of healthcare organizations on competency development. While educational institutions are responsible for preparing future nurses, competency continues to evolve after graduation through workplace experiences and professional socialization. Jackson (2024) emphasized that professional competency should be regarded as a lifelong developmental process requiring continuous support and engagement. Healthcare organizations therefore play a critical role in fostering environments that encourage learning, mentorship, and professional growth. Supportive leadership, structured orientation programs, and opportunities for continuing education have been associated with stronger competency development and greater confidence among nursing professionals.

The literature also highlights the importance of quality and safety competencies in contemporary nursing practice. Healthcare systems increasingly emphasize patient safety, quality improvement, and

evidence-based care as indicators of professional performance. AlRatrout et al. (2025) demonstrated that educational interventions based on the QSEN framework significantly improved nurses' knowledge, skills, and attitudes regarding patient safety and quality care. Similarly, Ferro and Yoder (2024) reported that exposure to QSEN competencies during nursing education positively influenced graduates' preparedness to engage in quality improvement activities and patient safety initiatives. These findings reinforce the argument that quality and safety competencies should remain central components of both educational curricula and professional development programs.

Technological transformation has emerged as another influential factor shaping competency expectations within the nursing profession. Digital health systems, telehealth services, simulation technologies, and artificial intelligence applications are increasingly integrated into healthcare delivery. Atkins et al. (2025) argued that future nursing practice will require professionals who are capable of combining technological proficiency with clinical expertise and patient-centered care. The emergence of artificial intelligence in particular presents both opportunities and challenges for nursing competency development. While advanced technologies may support clinical decision-making and improve healthcare efficiency, they also require nurses to develop new competencies related to data interpretation, ethical technology use, and digital communication.

The findings of this review further suggest that competency development is influenced by broader demographic and healthcare system changes. Notarnicola et al. (2025) emphasized that aging populations, increasing chronic disease burdens, workforce shortages, and changing patient expectations are reshaping competency requirements worldwide. Nurses are increasingly expected to demonstrate flexibility, cultural competence, leadership abilities, and systems-thinking skills in addition to traditional clinical expertise. These evolving expectations indicate that competency frameworks must remain responsive to emerging healthcare challenges and societal needs. An important theme identified throughout the literature is the role of lifelong learning in maintaining professional competency. Competence cannot be viewed as a fixed achievement attained upon graduation because healthcare knowledge and practice standards continue to evolve. Jackson (2024) argued that ongoing professional development is essential for ensuring competency maintenance throughout a nurse's career. Similarly, Lewis et al. (2022) emphasized that competency-based approaches encourage continuous self-assessment and professional growth rather than episodic educational achievement. This perspective aligns with contemporary views of nursing as a profession characterized by continuous learning and adaptation.

Several implications emerge from these findings. For nursing education, the evidence supports continued investment in competency-based curricula, simulation-based learning, and authentic clinical experiences that facilitate knowledge application. For healthcare organizations, the findings highlight the importance of mentorship programs, supportive leadership, and professional development opportunities that promote competency growth after graduation. For policymakers, the reviewed literature underscores the need for standardized competency frameworks and assessment approaches capable of ensuring consistent professional standards across educational and clinical settings. Although the literature provides valuable insights into competency development, important gaps remain. Variability in competency definitions, assessment methods, and educational approaches continues to limit comparability across studies. Furthermore, relatively little evidence exists regarding the long-term effects of competency-based interventions on patient outcomes, workforce retention, and healthcare quality indicators. Future research should therefore focus on longitudinal evaluations of competency development and the effectiveness of educational and organizational strategies designed to strengthen professional practice.

Overall, the evidence reviewed in this paper indicates that nursing competency development is influenced by a complex interaction of educational, clinical, organizational, and technological factors. Successfully bridging the knowledge–practice gap requires coordinated efforts across nursing education, healthcare organizations, and professional development systems. Strengthening these areas will be essential for preparing a competent nursing workforce capable of meeting the demands of modern healthcare and delivering safe, high-quality, and evidence-based patient care.

3. Conclusion

Nursing competency is a cornerstone of safe, effective, and high-quality healthcare delivery. As healthcare systems continue to evolve in response to technological advancements, demographic transitions, increasing patient complexity, and changing workforce demands, the competencies required of nurses have expanded considerably. Contemporary nursing practice requires not only strong clinical knowledge and technical skills but also critical thinking, clinical judgment, communication, leadership, adaptability, and a commitment to lifelong learning. This review highlights the persistent gap between theoretical knowledge and its application in clinical practice, a challenge that continues to affect nursing education and healthcare systems worldwide. The findings indicate that competency development is influenced by a complex interaction of educational, clinical, organizational, and technological factors. While nursing education provides the essential foundation for professional practice, competency is ultimately strengthened through meaningful clinical experiences, supportive work environments, mentorship, and continuous professional development.

The reviewed literature further demonstrates the growing importance of competency-based education as a strategy for improving practice readiness and facilitating the transition from knowledge acquisition to clinical performance. Competency-based approaches, together with simulation-based learning, quality and safety initiatives, and structured transition-to-practice programs, have shown considerable potential in enhancing nurses' ability to apply knowledge effectively in real-world healthcare settings. However, challenges related to curriculum implementation, competency assessment, resource availability, and workforce pressures continue to influence the effectiveness of these interventions. An important finding of this review is that nursing competency should not be viewed as a fixed achievement attained at graduation. Rather, it represents a dynamic and continuously evolving process that requires ongoing learning, reflection, and adaptation throughout a nurse's professional career. Emerging healthcare technologies, including digital health systems and artificial intelligence applications, are creating new competency requirements that will further shape the future of nursing practice. Consequently, educational institutions and healthcare organizations must work collaboratively to ensure that nurses are adequately prepared to meet these evolving demands.

In conclusion, bridging the gap between knowledge and practice remains one of the most critical priorities in contemporary nursing. Strengthening nursing competency requires integrated efforts across education, clinical practice, leadership, and policy development. By fostering competency-based learning, supporting continuous professional growth, and creating environments that encourage knowledge application and innovation, the nursing profession can develop a resilient, adaptable, and practice-ready workforce capable of delivering safe, evidence-based, and patient-centered care in an increasingly complex healthcare landscape.

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