

Development of nursing competencies and the role of medical simulation in nursing education

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Abstract

Dynamic demographic and epidemiological changes, together with increasing demands for healthcare quality, have driven the development of Advanced Practice Nursing (APN), characterized by expanded autonomy and advanced clinical competencies. Medical simulation plays an important role in preparing nurses for these responsibilities by integrating theoretical knowledge with practice, supporting decision-making and communication skills. This study aimed to analyze the development of nursing competencies in Poland within the European context and to evaluate the role of medical simulation in preparing nurses for APN roles. A narrative rapid review was conducted. Literature published between 2015 and 2026 was identified in PubMed, Scopus, CINAHL, and the Polish Medical Bibliography, along with selected national and international legal documents. Data were analyzed using narrative synthesis supported by thematic tables. Expanding nursing competencies enhances professional autonomy and professionalization but requires educational and legal reforms. Medical simulation supports competency implementation and improves patient care quality.

Introduction

In recent decades, the role of nurses has undergone significant transformation as a result of dynamically changing population health needs and steadily increasing expectations regarding the quality, efficiency, and safety of healthcare. Demographic and epidemiological changes, population ageing, and the growing number of patients with chronic diseases and multimorbidity have generated an increased demand for advanced nursing services [1–3]. At the same time, the development of nursing professional competencies has evolved toward Advanced Practice Nursing (APN) [4]. This model assumes an expansion of professional autonomy and a strengthening of the nursing role in diagnostic and therapeutic processes through the development of advanced clinical, decision-making, communication, and leadership competencies. Growing demands placed on nursing staff and the need to ensure high-quality healthcare necessitate the education of increasingly specialized nurses prepared to assume new professional roles and make responsible clinical decisions.

Medical simulation is currently one of the key educational tools in nursing education, enabling the integration of theoretical knowledge with clinical practice, the improvement of technical skills, and

the development of non-technical competencies such as communication, interprofessional collaboration, and decision-making in high-risk situations. Consequently, the use of medical simulation in nursing education plays a crucial role in preparing nurses to function in advanced practice roles and to meet the increasing demands of contemporary healthcare systems [5–8].

Aim

The aim of this study was to analyze the development of nursing competencies in Poland in a European context and to assess the role of medical simulation in preparing the nursing workforce for APN.

Methods

The study was conducted as a narrative rapid review aimed at identifying and synthesizing current scientific evidence as well as relevant systemic and legal documents [9]. Literature searches were performed in PubMed, Scopus, CINAHL, and the Polish Medical Bibliography (*Polska Bibliografia Lekarska*), covering publications from 2015 to 2025, using the following keywords: nursing competencies, advanced practice nursing, medical simulation, and nursing education in Poland/Europe. In parallel, legal acts and regulatory

documents were reviewed using the Internet System of Legal Acts (ISAP), as well as the websites of the Ministry of Health, the National Health Fund, the World Health Organization, and the International Council of Nurses. Exclusion criteria included publications outside the thematic scope, non-full-text articles, studies not related to nursing competencies, medical simulation, or APN, and documents duplicating the same data. Data were analyzed using a narrative synthesis approach supported by thematic tables, allowing the identification of legislative trends, implementation barriers, and educational recommendations.

Development of nursing competencies

In Europe, the process of expanding nursing competencies is reflected in both systemic solutions and legal regulations. One of its key manifestations is the granting of prescribing rights to nurses. This process began in 1992 in the United Kingdom and subsequently expanded to other countries, including Sweden, Norway, Ireland, Denmark, Finland, the Netherlands, Cyprus, Spain, Estonia, France, and the Canton of Vaud in Switzerland [10]. The scope of these prescribing rights remains heterogeneous and includes, among others, the conditions for issuing prescriptions, the level of decision-making autonomy, and the categories of medicines authorized for prescription [11].

The expansion of nursing competencies in European countries is part of a broader process of healthcare system modernization, aimed at more efficient use of human resources and improved access to healthcare services. The healthcare workforce crisis in the European Union requires systemic measures, including the development of competencies, optimization of skill mix and professional role differentiation, as well as investment in education and new professional qualifications, including nursing roles with expanded competencies [1]. Nursing competencies are regarded as an integral component of modern healthcare models, constituting an important element of strategies to address healthcare workforce shortages and to respond to the growing health needs of societies. According to the definition of the International Council of Nurses, APN represents a level of practice requiring advanced academic education, a high degree of clinical autonomy, and the ability to make complex diagnostic and therapeutic decisions [4]. The World Health Organization emphasizes that the development of APN is one of the key directions for strengthening healthcare systems and increasing their resilience to future challenges [2].

An example of the systemic implementation of Advanced Practice Nursing is the United States, where this model has functioned as an integral part of the healthcare system since the second half of the twentieth century. Advanced Practice Nursing

includes independent patient management, diagnosis, prescribing of medicines, and initiation and modification of therapies, although detailed legal regulations vary by state [12].

Analysis of European and American experiences indicates that the development of nursing competencies is a long-term and multidimensional process requiring coordinated actions in the areas of education, legal regulation, and organization of clinical practice. Increasing emphasis is placed on the need to educate nurses at a level that enables them to function effectively within complex healthcare systems and to assume roles involving expanded clinical responsibility.

In Poland, the expansion of nursing professional competencies constitutes an important stage in the modernization of the healthcare system and in strengthening the role of nurses within the structure of healthcare services. The expansion of prescribing competencies for nurses and midwives was introduced with the Amendment Act of 22 July 2014, which came into force in January 2016 [13]. Under the new regulations, nurses and midwives obtained the right to independently prescribe selected medicines and issue prescriptions, both as part of continuation of physician-initiated treatment and within independent professional practice. The initially authorized medicines included, among others, analgesics, anti-inflammatory drugs, vitamin D₃, and selected antibiotics. Over time, this catalogue was systematically expanded. In 2025, following amendments to regulations governing the competencies of nurses and midwives, the list of active substances contained in medicines, foods for special medical purposes, and medical devices that may be prescribed by nurses and midwives was updated. These changes also extended the range of diagnostic tests for which nurses and midwives are authorized to issue referrals [14].

Data from the National Health Fund indicate that after an initial period of limited uptake, the number of prescriptions issued by nurses began to increase. By October 2020, nearly 2 million continuation prescriptions and more than 25,000 independent prescriptions had been issued [15]. In 2023 alone, according to data from the e-Health Centre, nurses and midwives issued over 5.2 million prescriptions and provided more than one million prescription-related consultations, illustrating the scale of implementation of this competency in professional practice [16].

Nursing competencies in wound management are being gradually and consistently expanded. Legislative changes, including the Regulation of the Minister of Health of 18 January 2018 [17] concerning the list of active substances contained in medicines, foods for special medical purposes, and medical devices prescribed by nurses and midwives, as well as the list of diagnostic tests, enable nurses to independently prescribe selected medical devices, including specialist dressings. Nurses with appropriate qualifications

(completion of a specialist course, specialization, or a master's degree in nursing) may provide comprehensive wound therapy, including assessment, selection of treatment methods, and patient education. The development of specialized wound care clinics and the guidelines of the Polish Wound Management Society support standardization of practice and strengthen the role of nurses within interdisciplinary therapeutic teams [18]. Since January 2023, patients discharged from hospital with chronic wounds, newly created stomas, or requiring urinary catheterization may be covered by comprehensive nursing care within transitional care. The aim of this solution is to increase access to nursing services provided in primary healthcare, such as wound care, stoma and urological care consultations, and to ensure health education for patients requiring intensive post-hospital support [19].

One of the more significant steps in expanding nursing professional competencies is granting nurses the authority to refer patients for specific diagnostic tests, with the aim of improving access to care, streamlining diagnostic processes, and reducing the workload of physicians, particularly in primary healthcare. In accordance with binding statutory provisions, nurses and midwives who possess appropriate qualifications are authorized to issue referrals for selected diagnostic tests [20]. Regulations of the Minister of Health defining the scope of services that nurses and midwives may perform independently without a physician's order specify in detail the list of diagnostic tests (Annex 6) and diagnostic material that may be collected (blood, urine, swabs, etc.). The use of these competencies requires not only appropriate substantive qualifications (completion of defined stages of education – master's degree, specialization, or relevant courses), but also practical training, institutional support (healthcare facilities and diagnostic systems), and acceptance and cooperation within the medical team. Such expansion of competencies enables faster diagnostics and earlier detection of abnormalities, particularly in primary care settings, where a large proportion of diagnostic cases may be identified using basic tests.

In Poland, nurses may participate in nutritional status assessment, implement nutritional recommendations, and provide health education in this area. In clinical practice, they constitute a key component of hospital nutrition teams, being responsible, among others, for the administration of enteral and parenteral nutrition preparations and for monitoring patient responses, while collaborating with physicians, dietitians, and pharmacists in the selection and monitoring of nutritional therapy [21, 22]. In the United States, nurses specializing in medical nutrition are responsible for nutritional assessment, planning nutritional therapy, and monitoring treatment outcomes [23].

Although competencies related to health promotion and patient education have been inherent to

the nursing profession since its inception, they currently acquire new significance in the context of increasing professional autonomy. Nurses not only implement physicians' recommendations but increasingly independently plan, conduct, and evaluate preventive and educational programs, thereby responding to the needs of patients with chronic diseases [2, 3]. In Poland, nurses working in primary healthcare may independently implement preventive programs, including cardiovascular disease prevention programs and the adult health check program "My Health" (*Moje Zdrowie*), holding within these programs the same competencies as physicians [24].

Experiences related to the COVID-19 pandemic significantly contributed to breaking down traditional role divisions within healthcare systems and necessitated a new approach to professional competencies in medical professions. In response to epidemiological challenges, vaccination-related competencies were extended to a broader group of professionals, including nurses and midwives. Solutions initially introduced as temporary were gradually formalized and extended to include influenza vaccination and other vaccines recommended for adults. Currently, nurses and midwives – alongside pharmacists and paramedics – play a key role in the implementation of recommended immunizations, having competencies for independent patient qualification and vaccine administration. These changes, reinforced by amendments introduced in 2025 covering children aged over 9 years, permanently transform the model of preventive care in Poland and strengthen the role of independent nursing practice in the delivery of public health tasks [25].

Barriers to the expansion of competencies and their overlap in nursing practice

The process of implementing new nursing competencies encounters numerous organizational, legal, and cultural barriers. These include, among others, a lack of trust on the part of some members of the medical community, unclear procedures, insufficient remuneration for newly assigned tasks, and vaccines recommended for adults. Despite these challenges, international experience indicates that the expansion of nursing competencies brings tangible benefits to healthcare systems by increasing their flexibility and accessibility. The phenomenon of overlapping professional competencies (skill mix) constitutes an important element of contemporary healthcare system reforms [11]. It enables more efficient use of human resources through the redistribution of tasks among different professional groups.

Analysis of selected reports summarized in Table 1 indicates that the expansion of nursing professional roles is a global phenomenon, encompassing European, Asian, and American countries [10, 15, 23, 26–32].

The comparison highlights the diversity of skill mix models, ranging from nurse prescribing and the assumption of diagnostic tasks to independent management of care for patients with chronic conditions. In the majority of analyzed cases, the introduction of expanded competencies contributes to improved access to healthcare services, enhanced quality of care, and increased professional prestige of nurses. At the same time, studies identify recurring implementation barriers, including limited acceptance by the medical profession, inadequately adapted legal regulations, and uncertainty regarding the scope of professional responsibility.

The results of literature reviews confirm that the quality of care provided by nurses is at least comparable to physician-led care, and in some areas – particularly in the prevention of cardiovascular diseases – even superior. Higher levels of patient satisfaction with nursing care have also been demonstrated, which is associated with longer consultation times and better communication [30, 33, 34].

One of the most important and well-documented examples of expanding nursing competencies is the authority to prescribe medicines. Studies conducted in Poland and other countries indicate that patients positively evaluate these changes, perceiving them as an opportunity to improve access to healthcare services and reduce waiting times for appointments [28, 32]. The authors emphasize that this process has been closely linked to changes in education systems and the introduction of additional courses and curricular content in pharmacology and prescribing.

The expansion of nursing competencies leads to increased autonomy, professionalization, and prestige of the profession; however, it requires parallel changes in education systems, legal regulations, and remuneration policies. Effective implementation of skill mix models depends not only on the formal scope of professional authority but also on social acceptance, institutional support, and trust in nurses as independent professionals within healthcare systems.

Medical simulation in nursing education

In light of significant changes in the nursing role and the systematic increase in professional autonomy, it is necessary not only to enhance the quality of undergraduate education but also to improve clinical practice and prepare the workforce to undertake new, more autonomous tasks within healthcare systems. In response to growing educational demands, medical simulation has gained increasing importance in nursing education.

Medical simulation is an effective educational method that enables the acquisition of repeatable and controlled clinical experiences under conditions closely resembling real clinical practice. Its high educational potential supports the training of highly qualified healthcare professionals, which translates into a reduction in the number of errors made in clinical practice [5–8].

Medical simulation is a dynamically developing area of medical education, closely linked to technological advancement.

A significant expansion of simulation infrastructure in Poland was enabled by the Operational Programme Knowledge Education Development 2014–2020 (PO WER), under which medical simulation centers were established at 35 universities. These centers have become the foundation for implementing modern teaching methods that respond to the evolving needs of the healthcare system and prepare nurses for new professional roles and responsibilities.

Simulation may take various forms, including task trainers, high-fidelity simulators, computer-based simulations, and the use of virtual reality technologies. An important component of simulation-based education may involve standardized patients – trained individuals or actors portraying specific clinical symptoms and conditions [35]. The literature distinguishes three basic levels of simulation fidelity: low, intermediate, and high. These levels differ in terms of realism, equipment used, and the scope of competencies developed – ranging from basic technical skills in low-fidelity simulations to advanced competencies in communication, workflow organization, and clinical leadership in high-fidelity simulations [36, 37].

In 2025, the National Accreditation Council for Nursing and Midwifery Schools presented recommendations concerning the development and assessment of practical skills and social competencies in simulated conditions [38]. This document was prepared in response to the amendment of the Regulation of the Minister of Science of 10 October 2024 on standards of education preparing for medical professions [39]. The recommendations emphasize the need to incorporate simulation-based education into interdisciplinary courses aimed at preparing students for teamwork within therapeutic teams, developing awareness of professional scopes of practice, and improving the ability to independently provide healthcare services using simulation methods. For undergraduate students, it is recommended that simulation be used to develop competencies related to continuation of prescribed medications, foods for special medical purposes and medical devices, issuing prescriptions and orders in accordance with binding regulations, as well as independent medication administration, selection and use of medical devices, ordering diagnostic tests, and administering medications from life-saving kits. Graduate students, in turn, should refine competencies related to independent prescribing of medicines, foods for special medical purposes and medical devices, issuing prescriptions and orders, making therapeutic decisions, and performing therapeutic procedures in complex and advanced clinical conditions. This scope also includes providing educational, preventive, and therapeutic consultations (Table 2).

Table 1. Expansion of nursing competencies in selected countries

Author and year	Country/context	Scope of expanded competencies	Benefits	Barriers/challenges
Boeykens and Van Hecke (2018) [23]	Belgium (Nutrition Support Nurse – NSN)	Clinical nutrition nurse specialist: identification of malnutrition risk, selection and monitoring of nutritional therapy, education of patients and staff	Improved quality of nutritional care, reduction in infections (sepsis reduced from 33% to 4%), cost savings, increased professionalization of nursing	Lack of formal regulations, unclear professional titles, risk of exceeding medical competencies, insufficient education
Hassankhani H <i>et al.</i> (2018) [26]	Iran (Emergency nurses)	Expansion of professional roles in clinical skills consistent with education	Positive attitudes toward expanded competencies, increased job satisfaction, enhanced professional status, improved continuity of high-quality care	Variable levels of clinical competency, lack of research evidence, need for stronger educational support
Maier CB (2019) [10]	13 European countries	Nurse prescribing (full or limited formulary)	Increased access to services, high patient satisfaction, effectiveness comparable to physician prescribing	Requirement for medical supervision in most countries, regulatory and educational differences, lack of recognition of qualifications across countries
Zimmermann A <i>et al.</i> (2020) [27]	Poland (Nurse prescribing)	Independent and supplementary prescribing (31 substances), referrals for diagnostic tests	Greater professional autonomy, improved access to treatment, reduced physician workload	Increased legal responsibility, lack of additional remuneration, insufficient preparation, limited patient awareness of nursing competencies
Kilańska D <i>et al.</i> (2022) [28]	Poland (Primary healthcare)	Prescribing medicines and issuing referrals within the Ministry of Health lists, continuation of pharmacotherapy	Improved access to primary care, reduced waiting times, continuity of care for chronically ill patients, greater professional autonomy and social status	Limited list of substances, no authority to prescribe strong or psychotropic drugs, restrictions for midwives, increased legal responsibility and workload
Fontenot NM <i>et al.</i> (2022) [29]	USA (MPAC© – physical assessment)	Standardized physical assessment and documentation in electronic medical records	Improved quality and timeliness of assessments, earlier detection of patient deterioration	Lack of training and equipment, unclear responsibilities, an excessive workload
Paier-Abuzahra M <i>et al.</i> (2024) [30]	Europe (Task shifting in primary care)	Transfer of diagnostic tasks, prescribing, triage, patient referral	Higher patient satisfaction, better clinical outcomes, care safety comparable to that provided by physicians	Need to clarify the role of nurses, longer consultations, and lack of clear legal regulations
Bartosiewicz A <i>et al.</i> (2025) [15]	Poland (Prescribing in 2016–2021)	Independent prescribing of selected medications (e.g. antibiotics, vaccines), expansion of the list of substances	Increased access to services, enhanced professional prestige and autonomy, positive evaluation among nurses	Limited list of medications, lack of full social acceptance, administrative burden
Silies K <i>et al.</i> (2025) [31]	Germany (Expanding competencies in long-term care)	Management of chronic diseases, communication with families, organization of long-term care	Improved quality of care, reduced hospitalizations, staff retention, increased sense of value and influence among nurses	Unclear role descriptions, limited implementation in long-term care, low acceptance of the new model
Madhura NL <i>et al.</i> (2025) [32]	India (Nurse Practitioner – NP)	Diagnosis, treatment, medication prescribing, provision of comprehensive care	Increased access to care, cost reduction, strengthened nursing role	Lack of legal framework and acceptance by the medical community, practice limitations

Source: Authors' own elaboration based on literature review

Table 2. Examples of simulation scenarios and professional competencies developed during their implementation

Scenario topic	Developed competencies
Undergraduate (Bachelor's degree)	
Simulated primary healthcare (PHC) visit of a patient with a selected chronic disease and prescription issuance. Nursing consultation: history taking, physical examination, patient education (scenario with a standardized patient)	Independent prescribing, communication skills, medical documentation, prevention
Simulated home visit. Independent wound assessment, selection of an appropriate dressing from available materials, instruction of the patient/caregiver	Independent selection of dressings – clinical decision-making, patient/caregiver education, communication, care planning (e.g., physician consultation in case of deterioration)
Physical examination of the patient and decision to refer for selected diagnostic tests	Diagnostics – clinical decision-making, medical documentation, collaboration with a physician
Interdisciplinary teamwork. Coordination of care by a nurse for a patient admitted to a hospital ward	Delineation of professional competencies, team management
Graduate (Master's degree)	
Management of pharmacotherapy in a multimorbid patient	Medical record analysis, prescribing, monitoring of adverse effects, professional counseling
Nursing consultation in primary healthcare	Independent consultation of a patient with a chronic condition, care planning, patient education
Team coordination in an emergency situation	Leadership role in an acute clinical situation
Interdisciplinary collaboration	Joint treatment planning within a therapeutic team, leadership, team management

Source: Authors' own elaboration based on the appendix to Resolution No. 32/VI/2025 [38].

Medical simulation should be utilized both in academic institutions and healthcare facilities. Research indicates that its application improves professional behaviors, including adherence to patient rights and achievement of team-based goals, although further refinement is required, particularly in the area of cultural competencies [40–42]. A key advantage of simulation is the possibility of designing educational scenarios with precisely defined learning objectives, which supports knowledge acquisition as well as objective verification and confirmation of students' skills and competencies [43–47].

The implementation of medical simulation scenarios focused on developing prescribing competencies enables gradual and safe acquisition of this skill. Independent prescribing may constitute either the primary objective of simple educational scenarios or one component of a nursing consultation or advanced nursing practice. A critical aspect of independent prescribing by nurses is proficiency in physical examination, which forms the basis for accurate clinical decision-making. These competencies can be systematically developed during simulation-based training – from simple exercises using task trainers to advanced clinical scenarios. Mastery of physical examination techniques strengthens professionalism, supports evidence-based practice, and constitutes the foundation for independent clinical decision-making [48–50].

Studies indicate that developing these competencies already at the undergraduate level is crucial for preparing graduates to function in modern clinical environments [23, 29]. Teaching physical examination should not be limited to mastering technical skills alone but must also include the development of diagnostic clinical reasoning and the ability to interpret collected data within the nursing process, including critical thinking and clinical analysis. In the study by Sanlialp *et al.* [51], it was emphasized that simulation enables nursing students to practice skills in a controlled environment without risk to patients, with immediate feedback and opportunities for repeated scenario execution, thereby increasing self-confidence and competency levels.

With increasing professional autonomy, nurses increasingly assume key roles within interdisciplinary teams, collaborating with physicians, physiotherapists, and other specialists. Integrating simulation into educational processes creates conditions for interprofessional training, which enhances skills related to work organization, responsibility transfer, effective teamwork, leadership, and communication [52–54]. Research demonstrates that interprofessional simulations help nursing students better understand their own professional role as well as the roles of other members of the therapeutic team, which is essential for effective collaboration and high-quality patient care [55–57].

Medical simulation is recognized as one of the most effective tools for developing non-technical competencies among nurses, such as interpersonal communication, empathy, teamwork, problem-solving, and self-confidence. Studies confirm that regular participation in simulation-based training leads to better preparedness for real clinical challenges [58–60]. Effective teamwork and clear communication significantly influence quality of care and patient outcomes [61]. Simulation also supports the development of empathy and interpersonal competencies, which directly translates into the quality of health education and the effectiveness of preventive interventions [44].

Medical simulation offers broad opportunities for developing practical skills in a safe and controlled educational environment. It constitutes an essential component of modern nursing education, supporting the comprehensive development of the nursing role – not only as a provider of healthcare services but also as an autonomous specialist in care delivery, health promotion, and patient education. Table 2 presents examples of medical simulation scenarios and their alignment with professional competencies at the undergraduate and graduate levels; however, appropriately designed simulation scenarios also enable the practical development of competencies required for Advanced Practice Nursing, the implementation of which is planned in Poland [62].

Contemporary generations of students are increasingly willing and confident in using new technologies, demonstrating a natural ease in their application. The use of tools such as virtual reality headsets, educational games, and mobile applications not only enhances the attractiveness of teaching activities but also becomes an important element of modern education, enabling the achievement of high educational standards. In this context, medical simulation constitutes an effective educational tool that allows the implementation of learning scenarios using advanced information and communication technologies, serious games, and communication systems.

A key component of the simulation process is immediate feedback, which enables students to continuously analyze their actions and introduce necessary corrections. Debriefing supports the learning process through reflection on one's own performance, development of non-technical competencies, and building self-confidence. Studies confirm that properly conducted debriefing significantly improves students' preparedness for clinical practice [63, 64]. Regular validation of competencies using simulation supports the maintenance of high skill levels and prepares future nurses for work in real clinical environments [65, 66].

Medical simulation enables a realistic assessment of nursing competencies and is widely used in the development of students' clinical skills, particularly in the areas of patient assessment and management of clinical situations [67]. It may include both formative

assessments conducted during the educational process and summative assessment performed at its completion [68].

Implications for practice and conclusions

The literature review confirms a global trend toward the expansion of nursing competencies in response to workforce shortages and population ageing. Based on the synthesized findings, the following conclusions and implications for nursing practice can be drawn:

- **Expansion of professional autonomy:** Legislative changes in Poland have successfully expanded the scope of independent professional practice. This includes not only nurse prescribing and diagnostic referrals but also advanced wound management and immunizations, demonstrating a clear shift towards the Advanced Practice Nursing model. Overcoming implementation barriers: Despite positive clinical outcomes and increased patient satisfaction, the full utilization of overlapping professional competencies (skill mix) is hindered by cultural and organizational barriers. These include inadequate remuneration for newly assigned tasks, increased workload, and limited acceptance by some medical professionals.
- **Role of medical simulation:** Medical simulation is an indispensable educational tool for safely bridging the gap between theoretical knowledge and the complex clinical decision-making required for autonomous practice. It is particularly crucial for mastering physical examination and independent prescribing in a risk-free environment.
- **Interprofessional collaboration:** Integrating simulation into nursing education fosters essential non-technical competencies, such as leadership, teamwork, and interpersonal communication. These skills are critical for nurses assuming increasingly autonomous roles within modern, interdisciplinary healthcare teams.
- **Systemic and educational support:** Maintaining expanded competencies requires robust systemic support and coherent educational programs. This includes the use of standardized simulation scenarios, immediate feedback, and structured debriefing for both formative and summative competency assessments at undergraduate and graduate levels.
- **Future research:** Subsequent studies must focus on evaluating the effectiveness of specific forms of simulation and establishing standardized educational scenarios to ensure uniform, high-quality preparation of nurses for modern healthcare challenges.

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References

- European Parliament. The health workforce crisis in the European Union: policy options for improving the sustainability of healthcare systems and employment and working conditions in the healthcare sector. Policy Department for Transformation, Innovation and Health; 2025. PE 772.481.
- World Health Organization. State of the world's nursing 2020: investing in education, jobs and leadership. World Health Organization; 2020. Accessed October 16, 2025. <https://www.who.int/publications/i/item/9789240003279>
- Cestari VR, Florêncio RS, Moreira TM, de Paula Pessoa VLM, Barbosa IV, Teixeira Lima FE, Custódio IL. Nursing competencies in promoting the health of individuals with chronic diseases. *Rev Bras Enferm.* 2016; 69(6): 1195-1203.
- International Council of Nurses. Guidelines on advanced practice nursing. ICN; 2020.
- Brodowicz-Król M, Malm M, Wiśniewska KE, Więch P, Kaczor-Szkodny PM. Effectiveness of medical simulation among nursing students. *Ann Agric Environ Med.* 2026; 33: 105-111.
- Gore T, Thomson W. Use of simulation in undergraduate and graduate education. *AACN Adv Crit Care.* 2016; 27(1): 86-95.
- Girzelska J, Guz E, Nieckula M, Dąbrowski M. Medical simulation – innovation in nursing education. *Pielęgniarstwo XXI Wieku.* 2019; 18(4): 231-235.
- Mason ZA. Simulation learning: exploring its transformative influence on nursing practice. *Nurs Stand.* 2024; 39(12): 51-55.
- Khangura S, Konnyu K, Cushman R, Grimshaw J, Moher D. Evidence summaries: the evolution of a rapid review approach. *Syst Rev.* 2012; 1: 10.
- Maier CB. Nurse prescribing of medicines in 13 European countries. *Hum Resour Health.* 2019; 17: 95.
- Kowalska-Bobko I, Gałązka-Sobotka M, Frąckiewicz-Wronka A, Badora-Musiał K, Buchelt B. Krzyżujące się kompetencje (skill mix) w zawodach medycznych i okołomedycznych. *Med Pracy.* 2020; 71(3): 337-352.
- American Association of Nurse Practitioners. NP fact sheet. Published 2023. Accessed October 16, 2025. <https://www.aanp.org>
- Ustawa z dnia 22 lipca 2014 r. o zmianie ustawy o zawodach pielęgniarki i położnej oraz niektórych innych ustaw. *Dz.U.* 2014 poz. 1136; *Dz.U.* 2024 poz. 653.
- Obwieszczenie Ministra Zdrowia z dnia 23 lipca 2025 r. w sprawie ogłoszenia jednolitego tekstu rozporządzenia w sprawie wykazu substancji czynnych zawartych w lekach, środkach spożywczych specjalnego przeznaczenia żywieniowego i wyrobach medycznych ordynowanych przez pielęgniarki i położne oraz wykazu badań diagnostycznych. *Dz.U.* 2025 poz. 1054.
- Bartosiewicz A, Krukowski J, Zalas A. Nurse prescribing in Polish nurses' opinions: a comparative study between 2016 and 2021. *Fam Med Prim Care Rev.* 2025; 27(2): 153-158.
- Centrum e-Zdrowia. Liczba porad pielęgniarskich oraz liczba wystawionych recept przez pielęgniarki i położne. Accessed October 16, 2025.
- Rozporządzenie Ministra Zdrowia z dnia 18 stycznia 2018 r. w sprawie wykazu substancji czynnych zawartych w lekach oraz wykazu badań diagnostycznych ordynowanych przez pielęgniarki i położne. *Dz.U.* 2025 poz. 1054. Accessed October 16, 2025. <https://dziennikustaw.gov.pl/D2025000105401.pdf>
- Polskie Towarzystwo Leczenia Ran. Wytyczne dotyczące leczenia ran. Accessed October 16, 2025. <https://ptlr.org>
- Narodowy Fundusz Zdrowia. Zarządzenie Nr 3/2023/DSOZ Prezesa NFZ z dnia 9 stycznia 2023 r. w sprawie warunków zawarcia i realizacji umów w POZ. NFZ; 2023.
- Rozporządzenie Ministra Zdrowia z dnia 28 lutego 2017 r. w sprawie rodzaju i zakresu świadczeń udzielanych samodzielnie przez pielęgniarkę albo położną. *Dz.U.* 2017 poz. 497 z późn. zm.
- Krajewska-Kuślak E, Guzowski A. Rola pielęgniarki w zespole żywieniowym. *Pielęgniarstwo XXI Wieku.* 2020; 19(1): 31-38.
- Szewczyk MT, Cwajda-Białasik J. Żywienie dojelitowe i pozajelitowe w praktyce pielęgniarskiej. *Pielęg Chirurg Angiol.* 2025; 1(3): 15-22.
- Boeykens K, Van Hecke A. Advanced practice nursing: nutrition nurse specialist role and function. *Clin Nutr ESPEN.* 2018; 26: 72-76.
- Rozporządzenie Ministra Zdrowia z dnia 24 września 2013 r. w sprawie świadczeń gwarantowanych z zakresu podstawowej opieki zdrowotnej. *Dz.U.* 2023 poz. 1427 z późn. zm.
- Badora-Musiał K. W kierunku koordynacji w podstawowej opiece zdrowotnej. 1st ed. Wydawnictwo Uniwersytetu Jagiellońskiego; 2025.
- Hassankhani H, Hasanazadeh F, Powers KA, Dadash Zadeh A, Rajaie R. Clinical skills performed by Iranian emergency nurses: perceived competency levels and attitudes toward expanding professional roles. *J Emerg Nurs.* 2018; 44(2): 156-163.
- Zimmermann A, Cieplikiewicz E, Wąż P, Gaworska-Krzemińska A, Olczyk P. The implementation process of nurse prescribing in Poland – a descriptive study. *Int J Environ Res Public Health.* 2020; 17(7): 2417.
- Kilańska D, Lipert A, Guzek M, Engelseth P, Marczak M, Sienkiewicz K, Kozłowski R. Increased accessibility to primary healthcare due to nurse prescribing of medicines. *Int J Environ Res Public Health.* 2022; 19(1): 292.
- Fontenot NM, Hamlin SK, Hooker SJ, Vazquez T, Chen HM. Physical assessment competencies for nurses: a quality improvement initiative. *Nurs Forum.* 2022; 57(4): 710-716.
- Paier-Abuzahra M, Posch N, Spary-Kainz U, Radl-Karimi C, Semlitsch T, Jeitler K, Siebenhofer A. Effects of task shifting from primary care physicians to nurses: a protocol for an overview of systematic reviews. *BMJ Open.* 2024; 14(3): e078414.
- Silies K, Huckle T, Pohontsch N, Jarchow AM, Schütz K, Müller M, Lühmann D, Balzer K. A new role profile for nurses with expanded competencies promoting person-centered care in long-term care: a mixed-methods intervention development study. *BMC Geriatr.* 2025; 25(1): 492.
- Madhura NL, Joshi KP, Jamadar DC. Visionary nursing leadership: expanding nurse practitioner roles to enhance quality health care. *Cureus.* 2025; 17(1): e77009.
- Seale C, Anderson E, Kinnersley P. Comparison of GP and nurse practitioner consultations: an observational study. *Br J Gen Pract.* 2005; 55(521): 938-943.

34. Horrocks S, Anderson E, Salisbury C. Systematic review of whether nurse practitioners working in primary care provide equivalent care to doctors. *BMJ*. 2002; 324(7341): 819-823.
35. Olszewski AE, Wolbrink TA. Serious gaming in medical education: a proposed structured framework for game development. *Simul Healthc*. 2017; 12(4): 240-253.
36. Chmiel Z, Więch P, Przybek-Mita J, Hebel K, Bazaliński D. Medical simulation in the process of teaching wound prevention and treatment: literature review and analysis of personal experiences. *Pielęg Chirurg Angiol* 2024; 18(4): 113-120.
37. Grochowska A, Kołpa M, Stefanowicz-Kocoł A, Cunningham S, Lillo M, Schembri N, Abanifi PF, Pesonen HM, Kinnunen T, Anukka, Kukkola, Terri S, Koskela AS, Kero J, Feliciano S. Model hybrydowego nauczania i uczenia się z wykorzystaniem symulacji w dziedzinie geriatry uwzględniający aspekt kulturowy (GNurseSIM). GNurseSIM; 2022. Accessed August 2023. https://gnursesim.eu/wp-content/uploads/sites/42/2023/08/O1-Final-version_PL.pdf
38. Krajowa Rada Akredytacyjna Szkół Pielęgniarek i Położnych. Załącznik do uchwały nr 32/VI/2025 z dnia 27 marca 2025 r. w sprawie rekomendacji dotyczących kształtowania i oceny umiejętności praktycznych oraz kompetencji społecznych w warunkach symulowanych na kierunku pielęgniarstwo. Accessed October 16, 2025. <https://www.gov.pl/web/zdrowie/krajowa-rada-akredytacyjna-szkol-pielengniarek-i-polozych-kraszpip>
39. Rozporządzenie Ministra Nauki z dnia 10 października 2024 r. zmieniające rozporządzenie w sprawie standardów kształcenia przygotowującego do wykonywania zawodów medycznych. Dz.U. 2024 poz. 1514.
40. Anilema A, Chicaiza J, Dávila M, Olvera J. Clinical simulation in nursing: challenges, strategies and opportunities for competency development. *Salud Ciencia y Tecnología*. 2025; 5: 1442. doi:10.56294/saludcyt20251442.
41. Albalawi MM, Rezaq KA. Evaluating clinical skill competence and professional behaviors in nursing students following simulation training at the University of Tabuk. *SAGE Open Nurs*. 2024; 10: 23779608241274194.
42. Tong LK, Li YY, Au ML, Ng WI, Wang SC, Liu Y, Shen Y, Zhong L, Qiu X. The effects of simulation-based education on undergraduate nursing students' competences: a multicenter randomized controlled trial. *BMC Nurs*. 2024; 23(1): 400.
43. Starkweather A, Sargent L, Nye C, Albrecht T, Cloutier R, Foster A. Progressive assessment and competency evaluation framework for integrating simulation in nurse practitioner education. *J Nurse Pract*. 2017; 13(7): 301-310.
44. Cant RP, Cooper SJ. Use of simulation-based learning in undergraduate nurse education: an umbrella systematic review. *Nurse Educ Today*. 2017; 49: 63-71.
45. Tjøflåt I, Våga BB, Søreide E. Implementing simulation in a nursing education programme: a case report from Tanzania. *Adv Simul (Lond)*. 2017; 2: 17.
46. Park H, Yu S. Policy issues in simulation-based nursing education and technology development. *Health Policy Technol*. 2018; 7(3): 318-321.
47. Anderson M, Campbell SH, Nye C, Diaz D, Boyd T. Simulation in advanced practice education: let's dialogue!! *Clin Simul Nurs*. 2019; 26 (suppl C): 81-85.
48. Jarvis C. *Physical Examination & Health Assessment*. 8th ed. Elsevier 2020.
49. Bickley LS. *Bates' Guide to Physical Examination and History Taking*. 13th ed. Wolters Kluwer 2021.
50. Reeves S, Pelone F, Harrison R, Goldman J, Zwarenstein M. Interprofessional collaboration to improve professional practice and healthcare outcomes. *Cochrane Database Syst Rev*. 2017; 6: CD000072.
51. Şanlıalp Zeyrek A, Fidan Ö. Perceived self-efficacy in physical examination skills, clinical practice experiences, and utilization of findings in care plans among senior nursing students: a cross-sectional study. *BMC Nurs*. 2025; 24: 339.
52. Edelbring S, Allvin R, Karlsson K, Hjelmqvist H, Hjelm C, Brandt J, Tamás É. Interprofessional simulation is engaging and relevant: an educational strategy for interprofessional collaboration – survey study. *Lakartidningen*. 2019; 116: FHWL.
53. Guido-Sanz F, Diaz DA, Anderson M, Gonzalez L, Houston A. Role transition and communication in graduate education: the process. *Clin Simul Nurs*. 2019; 26: 11-17.
54. Parry M, Fey MK. Simulation in advanced practice nursing. *Clin Simul Nurs*. 2019; 26: 1-2.
55. Costello M, Prelack K, Faller J, Huddleston J, Adly S, Dolin J. Student experiences of interprofessional simulation: findings from a qualitative study. *J Interprof Care*. 2018; 32(1): 95-97.
56. Labrague LJ, McEnroe-Petitte DM, Fronda DC, Obeidat AA. Interprofessional simulation in undergraduate nursing programs: an integrative review. *Nurse Educ Today*. 2018; 67: 46-55.
57. Stow J, Morphet J, Griffiths D, Huggins C, Morgan P. Lessons learned developing and piloting interprofessional handover simulations for paramedic, nursing, and physiotherapy students. *J Interprof Care*. 2017; 31(1): 132-135.
58. Alrashidi N, Pasay-An E, Alrashidi MS, Alqarni AS, Gonzales F, Bassuni EM, Pangket P, Estadilla L, Benjamin LS, Ahmed KE. Effects of simulation in improving the self-confidence of student nurses in clinical practice: a systematic review. *BMC Med Educ*. 2023; 23(1): 815.
59. MacLean S, Kelly M, Geddes F, Della P. Use of simulated patients to develop communication skills in nursing education: an integrative review. *Nurse Educ Today*. 2017; 48: 90-98.
60. Sung TC, Hsu HC. Improving critical care teamwork: simulation-based interprofessional training for enhanced communication and safety. *J Multidiscip Healthc*. 2025; 18: 355-367.
61. Kaldheim HKA, Fossum M, Munday J, Creutzfeldt J, Slettebø Å. Professional competence development through interprofessional simulation-based learning assists perioperative nurses in postgraduation acute clinical practice situations: a qualitative study. *J Clin Nurs*. 2023; 32(11-12): 2757-2772.
62. Zarządzenie Ministra Zdrowia z dnia 1 kwietnia 2025 r. w sprawie powołania Zespołu do spraw określenia obszarów, w tym czynności zawodowych, w których może być realizowana zaawansowana praktyka pielęgniarek. *Dz Urz Min Zdrowia*. 2025; 26.
63. Husebø SE, Reiersen IÅ, Hansen A, Solli H. Post-simulation debriefing as a stepping stone to self-reflection and increased awareness: a qualitative study. *Adv Simul (Lond)*. 2024; 9(1): 33.
64. Fenzi G, Alemán-Jiménez C, Cayuela-Fuentes PS, Segura-López G, Leal-Costa C, Díaz-Agea JL. The expository

- phase of debriefing in clinical simulation: a qualitative study. *BMC Nurs.* 2025; 24(1): 476.
65. Leigh G, Stueben E, Harrington D, Hetherman S. Making the case for simulation-based assessments to overcome the challenges in evaluating clinical competency. *Int J Nurs Educ Scholarsh.* 2016; 13:/ijnes.2016.13.issue-1/ijnes-2015-0048/ijnes-2015-0048.xml. doi: 10.1515/ijnes-2015-0048.
66. Blier RG, Carroll BA, Contreras NE. can simulation scenarios be designed to assess ongoing nursing competence? *J Nurses Prof Dev.* 2023; 39(4): 214-220.
67. Andrew LA, Baxter PM. Incorporating innovative simulation activities into campus lab to enhance skill competence and critical thinking of second-semester associate degree nursing students. *Nurs Educ Perspect.* 2019; 40(1): 58-59.
68. Noh J, Oh EG, Kim SS, Jang YS, Chung HS, Lee O. Development and evaluation of a multimodality simulation disaster education and training program for hospital nurses. *Int J Nurs Pract.* 2020; 26(3): e12810.

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