

A Review of Reforms in Surgical Nursing Education

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Abstract

With the deepening of the “New Medical Sciences” concept and the rapid development of artificial intelligence technology, traditional surgical nursing education models are no longer sufficient to meet the urgent demand for multidisciplinary nursing professionals in modern healthcare services. This paper systematically reviews the latest research and practical achievements in surgical nursing education reform from both domestic and international sources over the past three years. It analyzes the shortcomings of current teaching models in terms of knowledge updating, practical skills development, and humanistic care, and focuses on exploring innovative approaches such as digital blended learning, case-based teaching methods, the integration of Standardized Patients (SPs) with narrative nursing, and the “sandwich-style” Yu Classroom teaching model. Research indicates that intelligent teaching integrating artificial intelligence and virtual simulation technology, comprehensive practical training that emphasizes both humanistic literacy and clinical reasoning, and curriculum-based ideological and political education reform centered on the “inquiry community model” have achieved significant results in enhancing students’ learning motivation, self-directed learning abilities, and comprehensive clinical competencies. This article aims to provide theoretical foundations and practical references for nursing educators, thereby promoting the continuous deepening of reforms in surgical nursing education toward intelligent, personalized, and humanistic directions.

Keywords

Surgical Nursing, Educational Reform, New Medical Disciplines, Blended Learning, Case-Based Teaching, Ideological and Political Education in the Curriculum, Standardized Patients

1. Introduction

Surgical nursing is a core foundational course in the nursing curriculum, combining theoretical, practical, and clinical applications (Lampropoulos et al., 2025). It plays a direct role in shaping students' core professional competencies. Not only does it bear the mission of imparting theoretical knowledge on the care of surgical conditions and fostering students' professional understanding, but it is also responsible for cultivating students' standardized clinical procedures, patient observation skills, clinical reasoning, and crisis management abilities (Xu, Cui, & Li, 2025). It serves as a vital bridge between classroom instruction and clinical practice, laying the foundation for students' future clinical work (Hou et al., 2025).

However, with the rapid development of medical technology and nursing models, as well as rising societal health demands, the traditional "teacher-centered, lecture-based, knowledge-imposition" teaching model is no longer adequate to meet the needs of nursing talent development in the new era (Xie et al., 2025). It has exposed numerous shortcomings: teaching content lags behind clinical practice, is out of step with the latest diagnostic and treatment guidelines and operational procedures, and lacks new clinical skills and concepts; practical instruction is weak, with training scenarios lacking realism; training often focuses on single-skill drills, making it difficult to bridge the gap between theory and practice; teaching methods are monotonous, neglecting the student's central role, stifling students' initiative and creativity, and hindering the development of their comprehensive competencies.

The development of new medical disciplines is driving the transformation of medical education toward competency- and quality-based training. Nursing education must adapt to this trend by integrating modern technology and humanistic concepts, closely aligning with clinical needs, restructuring the teaching system, and establishing a "theory + skills + qualities" trinity-based educational framework (Fralic, 1991). Based on this, this paper reviews the progress of surgical nursing teaching reform research both domestically and internationally, evaluates the effectiveness of these reforms, analyzes existing bottlenecks, and proposes reform concepts that integrate talent development with clinical needs, thereby providing a reference for deepening teaching reforms and enhancing the quality of nursing education (El Arab et al., 2025).

2. Current State of Research at Home and Abroad

2.1. Current Research Trends Abroad: The Deep Integration of Case Method and Skills Training

Overseas reforms in surgical nursing education rely on established systems and cutting-edge concepts. Research focuses on validating the clinical applicability of diverse teaching methods and evaluating the effectiveness of various instructional models, thereby forming a complete research cycle of "practical application-effectiveness evaluation-optimization and refinement" that provides solid support for

the implementation of teaching practices (Cardona-Morrell et al., 2016). Among these, the blended teaching method combining Problem-Based Learning (PBL) with medical literature reviews is a research hotspot. This approach moves beyond the one-way transmission of knowledge by designing inquiry tasks centered on real clinical problems, combined with training in literature search, organization, and presentation. It enables students to establish a framework for analyzing and solving clinical problems through independent inquiry and team discussions, effectively enhancing critical thinking, systematic analysis, and self-directed learning abilities. This helps students bridge the gap between theory and practice, thereby increasing learning engagement and satisfaction (GBD 2021 Stroke Risk Factor Collaborators, 2024).

Furthermore, the application of case-based teaching methods has matured in international research, forming a standardized system tailored to the nursing profession, complete with scientific implementation procedures and evaluation criteria (Bifarin et al., 2025). Centered on authentic clinical surgical nursing cases, this approach integrates abstract theories and practical skills into specific contexts, overcoming the drawbacks of fragmented knowledge. It guides students to think from the perspective of a nursing professional, flexibly applying knowledge and skills to solve real-world nursing problems through case analysis and plan formulation. This comprehensively develops clinical reasoning, knowledge application, and communication and collaboration skills, achieving a systematic enhancement of students' professional comprehensive qualities and core occupational competencies (Zhang et al., 2022).

2.2. Current State of Domestic Research: Exploring Diverse Teaching Models

2.2.1. Digital Blended Learning and the Empowerment of Artificial Intelligence

With the advancement of digital information technology and the ongoing digital transformation of education, digital blended learning has emerged as a key direction for nursing education reform in China due to its advantages in resource integration, flexible learning, and adaptability to various scenarios. It is also a crucial pathway for surgical nursing to overcome teaching bottlenecks and improve educational quality (Booker, Herr, & Tripp-Reimer, 2021). Domestic research clearly indicates that surgical nursing must transition from traditional offline one-way lecture models to digital and intelligent approaches, leveraging platforms such as Smart Vocational Education and Xuexi Tong to build a blended teaching system that integrates online and offline elements. This system consolidates and disseminates resources such as theoretical courses, practical training videos, and clinical cases, breaking through the constraints of time and space to facilitate students' autonomous and bite-sized learning, while simultaneously enabling instructors to provide real-time monitoring and precise guidance through online platforms.

The integration of artificial intelligence (AI) with nursing education has emerged

as a new trend in teaching reform, injecting fresh momentum into surgical nursing education. Researchers, combining course characteristics with clinical needs, have deeply integrated AI technology with clinical cases to build an intelligent case database (Montejo, Fenton, & Davis, 2024). By leveraging student performance analysis for personalized content delivery and utilizing virtual simulation to create immersive training scenarios, they have established a three-pronged teaching empowerment mechanism. This model effectively addresses the shortcomings of traditional practical instruction, significantly enhances the relevance and practicality of teaching, and facilitates the efficient translation of theoretical knowledge into practical skills among students (von Gerich et al., 2022).

2.2.2. The “Sandwich” Model of Rain Classroom and Blended Learning

In response to the highly theoretical nature of surgical nursing, the fragmented nature of its knowledge points, the high demands of clinical practice, and the cognitive characteristics of vocational students, domestic scholars have innovatively proposed the “Sandwich” integrated Yu Classroom teaching model, providing a targeted pathway for educational reform (Endacott et al., 2008). Centered on the principle of “alternating theory and practice, and integrating learning with practice”, this model utilizes the Yu Classroom platform to distribute pre-class preparation materials and monitor student progress; during class, instructors deliver focused explanations of key and difficult points, using interactive features to engage students; and after class, they assign extension tasks to bridge the gap between theory and practice, effectively organizing knowledge points and enhancing students’ independent learning and clinical reasoning abilities.

Furthermore, vocational colleges have closely aligned with the orientation of specialized nursing talent development, exploring diversified blended teaching practices. They have established online platforms, integrated digital resources, and constructed a closed-loop system of “online preparation + offline practice”. Students preview theoretical concepts and practical techniques online, then receive targeted guidance, engage in hands-on practice, and participate in case discussions offline. This approach effectively overcomes the limitations of traditional teaching, balances theoretical instruction with skill development, aligns with the learning pace and job requirements of vocational students, and enhances the effectiveness of teaching (Xie et al., 2023a).

2.2.3. The Integration of Standardized Patients (SPs) and Narrative Care

In surgical nursing education, the development of clinical practice skills involves more than just technical training; humanistic care and nurse-patient communication skills, as core professional competencies, directly impact the quality of nursing care and nurse-patient harmony. To address the shortcoming of traditional laboratory instruction—which emphasizes technical skills at the expense of humanistic care—domestic researchers have introduced a model combining standardized patients (SPs) with narrative nursing into laboratory teaching.

Standardized patients simulate the actual conditions and needs of real clinical patients, while narrative nursing guides students to practice empathy and prioritize humanistic care. The integration of these two approaches achieves a harmonious balance between technical proficiency and humanistic care (Al Yahyaei, 2024).

In teaching, standardized case scripts are designed based on common surgical disease scenarios. SPs simulate the patient's condition and needs throughout the entire process, while students, acting as nurses, provide care services. While performing professional procedures, students listen to and address the patient's needs through communication, provide psychological support using narrative nursing, and develop personalized care plans (Graf et al., 2020). Practice has demonstrated that this model bridges the gap between technical and humanistic training, enabling students to solidify their practical skills while enhancing their empathy and communication abilities and cultivating humanistic literacy. It provides a replicable paradigm for nursing laboratory teaching reform and lays the foundation for cultivating high-quality nursing professionals (Xie et al., 2023b).

2.2.4. The Model of Curriculum-Integrated Ideological and Political Education and Inquiry Communities

From the perspective of integrating ideological and political education into the curriculum, domestic researchers have drawn upon the distinctive features of surgical nursing courses to thoroughly explore the embedded ideological and political elements—such as the professional ethos of saving lives and alleviating suffering, a rigorous and meticulous scientific attitude, and the concept of humanistic care. By deeply integrating these elements with educational reforms centered on information technology, they have established a three-stage progressive teaching pathway under the inquiry community model: “pre-class awareness, in-class deepening, and post-class internalization” (Chen, Guan, & Zhuang, 2024). Before class, pre-study resources incorporating ideological and political elements are distributed via online platforms, allowing students to gain an initial understanding of the professional value of nursing. During class, with the inquiry community at the core, these elements are integrated into professional teaching activities such as case analysis and scenario simulations, thereby advancing knowledge acquisition and value formation simultaneously. After class, extension assignments that combine professional and ideological-political dimensions are assigned to encourage students to translate ideological and political concepts into practical actions (Lavelle et al., 2015).

This model has effectively enhanced students' mastery of professional knowledge, significantly strengthened their sense of professional identity in nursing and their inclination toward the nursing profession, and truly achieved the organic integration of professional instruction and ideological and political education, fully leveraging the synergistic effects of curriculum-based education and ideological and political education moving in the same direction (Hill, 2023).

3. Reform Proposals

Based on the current state of domestic and international research and teaching practices, how can we adapt to the distinctive characteristics of the current era of information-based education and effectively implement diverse teaching models in surgical nursing education? This paper proposes the following targeted teaching reform initiatives:

3.1. Developing an Intelligent, Case-Driven Blended Learning System

1) Intelligent Processing of Case Data: Researchers utilized multimodal data integration technology to consolidate various types of information from real-world clinical cases—including written medical records, imaging data, nursing procedure videos, and patient progression data. They standardized and structured this information, removing redundant details and supplementing key elements to build a comprehensive, clearly categorized, and uniformly standardized clinical case repository for surgical nursing. Simultaneously, they employed machine learning algorithms to intelligently optimize the repository. By analyzing case characteristics such as knowledge point coverage, clinical difficulty, and scenario complexity, the system enables intelligent and precise recommendations of learning cases along with scientific difficulty stratification. It matches students with appropriate learning cases and progression paths based on their knowledge mastery, learning progress, and practical skills, allowing them to transition gradually from basic, typical cases to complex, comprehensive ones. This creates a personalized and precise surgical nursing learning system, effectively enhancing the relevance and effectiveness of case-based learning.

2) Personalized Learning Paths: Leveraging the Learning Management System (LMS), the platform comprehensively records behavioral data throughout the entire surgical nursing learning process, covering dimensions such as online learning duration, exercise accuracy rates, case analysis quality, and practical training participation, thereby establishing a complete learning data profile. By leveraging big data analytics to deeply mine this data, we can precisely identify students' weaknesses in theoretical understanding, skill application, and clinical reasoning. Based on these insights, we intelligently and precisely deliver tailored instructional content, customizing learning resources and task plans for each student. This approach effectively addresses the shortcomings of traditional "one-size-fits-all" teaching, which overlooks individual differences, by implementing a student-centered, tailored teaching model. This makes instruction more targeted, helping students address their learning gaps and enhance the effectiveness of their learning.

3) Development of Immersive Practical Skills: By incorporating virtual reality (VR) and augmented reality (AR) technologies into teaching, the program uses specialized technical methods to highly realistically recreate the operating room environment. It accurately simulates surgical procedures, sudden changes in a patient's condition during surgery, and various other emergencies, creating a highly

realistic, interactive, and immersive environment for nursing practice. Students can repeatedly practice surgical assistance and emergency response in these virtual environments, free from the constraints of real clinical settings—such as limited resources, operational risks, and limited scenarios—effectively addressing the shortcomings of traditional clinical training. At the same time, through immersive training, students can familiarize themselves with surgical procedures, reinforce standard operating protocols, and repeatedly rehearse response strategies and collaborative workflows for unexpected situations, thereby substantially enhancing the emergency response capabilities and practical surgical assistance skills required for surgical nursing.

3.2. Deepening the Dual-Track Approach to Education Combining “Humanistic Care” and “Technical Skills”

1) Integration of Standardized Patients (SPs) with Narrative Care: In traditional surgical nursing simulation training, the comprehensive integration of standardized patients (SPs) and the narrative nursing model is employed to design realistic nursing scenarios based on typical clinical cases in surgery. Through role-playing, students perform technical procedures while using narrative nursing to listen to patients’ concerns and provide compassionate care. This dual-track training—combining technical skills with humanistic care—helps students internalize core professional competencies, fostering a nursing mindset that balances professionalism with compassion, and effectively enhances patient satisfaction in future clinical practice.

2) Multi-Dimensional Evaluation System: In line with the training objectives for surgical nursing, the institution has established a system that incorporates the Mini-Clinical Evaluation Exercise (Mini-CEX), a multidimensional comprehensive assessment framework that breaks away from the traditional, one-dimensional evaluation model that emphasizes technical skills at the expense of professional competencies. Based on standardized Mini-CEX assessments, this system evaluates professional skills—such as adherence to surgical nursing protocols and procedural accuracy—while simultaneously incorporating professional competencies including patient-centered care, specialized clinical interviews, and nurse-patient communication. Through clinical practice and interactive simulations, it conducts multi-dimensional quantitative and qualitative evaluations. This system enables a comprehensive assessment of students’ professional skills and competencies, using diverse evaluation methods to drive holistic teaching practices and ensure that the quality of talent development aligns with the practical demands of clinical nursing positions.

3.3. Deepening Ideological and Political Education in the Curriculum with a Focus on “Inquiry Communities”

1) Three-Stage Progressive Teaching: To break down the barriers between ideological and political education and the teaching of the surgical nursing program—which had previously operated as two separate entities—and to achieve a harmo-

nious integration of value cultivation, knowledge transmission, and skill development, the curriculum-based ideological and political education program has been designed as a three-stage progressive process: pre-class awareness, in-class deepening, and post-class application. This ensures that ideological and political content is fully integrated into all aspects of the curriculum. Before class, video case studies integrating professional ethics and introductory ideological and political content are shared via online platforms to lay the foundation for learning. During class, offline case discussions and role-playing exercises combine ideological and political elements with professional knowledge to deepen students' understanding. After class, reflective journals and social practice activities help internalize this understanding into action, thereby enhancing the effectiveness of education.

2) Resource Integration: To diversify the formats of surgical nursing education and enhance teaching effectiveness, online supplementary resources can be seamlessly integrated with in-person case-based instruction. Online platforms can be used to provide supplementary case studies, skill demonstration videos, and other resources to compensate for the limitations of in-person instruction; in-person sessions can focus on real-world clinical cases to conduct discussions and hands-on training, thereby deepening the application of knowledge. At the same time, we should fully leverage resources from nursing skills competitions and other teaching contests to guide instructional direction. By incorporating competition standards into daily teaching, we can use these events as a catalyst to stimulate students' initiative and competitive spirit, motivating them to proactively strengthen their professional skills and enhance their practical abilities, thereby achieving the educational goal of "promoting learning and practice through competition".

4. Conclusion

Reforms in surgical nursing education have entered a critical phase. Merely innovating teaching models is no longer sufficient to meet the demands of modern medical education and clinical nursing roles, nor can it produce nursing professionals who possess both specialized skills and comprehensive competencies. Moving forward, surgical nursing education reform must adhere to the core principle of "student-centeredness", break down traditional educational barriers, deeply integrate artificial intelligence and digital technologies, consolidate multi-modal clinical case resources, and establish an "intelligent, case-driven blended learning" model. This will enable precise and efficient teaching, helping students enhance their ability to apply knowledge and perform clinical practices.

At the same time, the reform must prioritize both "technical skills" and "humanistic care" equally, moving away from the tendency to emphasize skills at the expense of humanistic values. It should deepen the integration of Standardized Patients (SPs) and narrative nursing, enabling students to balance procedural standards with humanistic care in simulated scenarios, thereby enhancing their communication and empathy skills with patients. Furthermore, ideological and

political education should be deeply integrated into the entire professional teaching process. By leveraging the inquiry community model, we can instill a professional ethos and a sense of responsibility, thereby strengthening students' identification with professional values. The implementation of these measures is expected to overcome reform bottlenecks and cultivate high-quality, multidisciplinary surgical nursing professionals capable of meeting the evolving demands of modern medical science.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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