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Application and Development of Nursing Education in the Emergency Department and Surgical Critical Care

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Abstract: This paper explores theoretical frameworks in emergency and surgical critical care education, particularly the application and significance of situational simulation teaching. It analyzes teaching models, including traditional apprenticeship systems and micro-teaching methodologies, evaluating their respective advantages and limitations. The study identifies existing challenges such as fragmented curriculum development and faculty imbalance, while proposing targeted improvement measures. The paper emphasizes the strategic application of emerging technologies in educational reform.

Keywords: Emergency nursing education; Teaching models; Educational reform

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1. Introduction

With the continuous development of China's medical industry, the "Opinions on Deepening the Collaboration between Medical Education and Further Promoting the Reform and Development of Medical Education" issued in 2017 emphasized the importance of medical education reform. Nursing education, as an important component of medical education, plays a crucial role in emergency departments and surgical critical care. Various theories, such as situational simulation teaching, provide support for it, but there are currently many problems in teaching modes, resource allocation, curriculum construction, etc., such as the advantages and disadvantages of teaching modes in emergency departments of tertiary hospitals, insufficient teaching resources, and a gap between curriculum theory and practice. Therefore, conducting research on the reform of the nursing education system has important practical significance.

2. Theoretical foundations of nursing education in critical care nursing

2.1. Core theoretical framework of emergency nursing education

Situational simulation teaching has significant theoretical underpinnings in emergency nursing education, which is based on constructivist learning theory that emphasizes learners' active construction of knowledge and skills in real or near-real contexts [1]. By simulating emergency scenarios, nurses can experience and respond to various critical situations in a safe environment, thereby enhancing their clinical thinking and practical capabilities. The clinical decision tree model, grounded in evidence-based medicine, provides emergency nursing professionals with a systematic clinical decision-making approach, assisting nurses in making rapid and accurate diagnostic and treatment decisions based on patients' symptoms, signs, and examination results. Adult learning theory also plays an important role in the training of specialist nurses; this theory posits that adult learners are characterized by self-direction, rich life experience, and a focus on practicality. Therefore, in the training of specialist nurses, these characteristics should be fully taken into account, and flexible and diverse teaching methods such as case analysis and group discussions should be adopted to meet the learning needs of adult learners.

2.2. Characteristic theories of surgical critical care nursing education

Damage control theory emphasizes that in surgical critical care nursing, efforts should be made to avoid the exhaustion of patients' physiological potential caused by definitive surgery, and a phased treatment approach should be adopted [2]. The concept of enhanced recovery after surgery (ERAS) focuses on promoting patients' rehabilitation by optimizing various perioperative measures, such as reducing preoperative fasting time and encouraging early ambulation. In surgical nursing education, the construction system of this theoretical knowledge is crucial. It enables nursing staff to understand the special needs of critically ill patients, thereby providing more scientific and reasonable nursing care. Standardized patients (SPs) also play a unique role in skill training. By simulating real clinical scenarios, nursing staff can conduct various operational and communication exercises on SPs, improve their clinical skills and response capabilities, and better serve critically ill surgical patients.

3. Analysis of the application status of nursing education models

3.1. Implementation paths of clinical teaching in emergency departments

Domestic Grade A tertiary hospitals adopt diverse teaching models in emergency departments, with the traditional apprenticeship system and microteaching method each having distinct characteristics. The traditional apprenticeship system focuses on the inheritance of clinical experience; under the guidance of preceptors, students directly participate in clinical practice, enabling them to quickly accumulate practical operational experience. However, the teaching effect may vary due to individual differences among preceptors [3]. The microteaching method emphasizes the refinement and standardization of the teaching process, decomposing complex teaching content into multiple small teaching units, which helps students learn systematically but may lack the experience of real clinical scenarios. The application of high-fidelity patient simulators (HPS) in emergency department teaching has gradually gained attention. HPS can simulate various critical care scenarios, providing students with a safe and repeatable practice environment to enhance their clinical thinking and emergency response capabilities, but the current application coverage needs to be improved.

3.2. Bottlenecks in surgical critical care nursing training

Patients with multiple traumas present complex and acute conditions, and emergency rescue training has high

requirements for teaching resources. On one hand, clinical case resources are limited, making it difficult to meet the practical needs of a large number of trainees. Additionally, some cases lack systematicness and completeness, which is not conducive to trainees' comprehensive mastery of rescue processes [4]. On the other hand, simulation teaching equipment is insufficient or outdated, failing to truly simulate complex trauma scenarios and hindering the cultivation of trainees' practical operational capabilities.

In terms of fostering interprofessional collaboration capabilities, existing systems have certain obstacles. There is a lack of effective communication and collaboration mechanisms between different specialties, leading to potential disconnections in the process of patient treatment. Meanwhile, the assessment and evaluation system is incomplete, with no clear standards for assessing interprofessional collaboration capabilities. This makes it difficult to motivate nurses to actively improve such capabilities, thereby restricting the development of surgical critical care nursing training.

4. In-depth analysis of existing problems in the education system

4.1. Problems in the dimension of curriculum construction

4.1.1. Disconnection between theory and practice

In the nursing education system, there exists a disconnection between theory and practice in curriculum construction. Taking emergency and surgical critical care nursing education as examples, the lagging update of case libraries is one of the key factors. With the rapid development of medicine, clinical realities are constantly changing, but case libraries fail to keep pace timely, resulting in discrepancies between the cases encountered by nursing students and actual clinical scenarios [5]. This leads to skill deviations when nursing students apply theoretical knowledge to practice. Meanwhile, due to the outdated cases, students struggle to accurately grasp the key points of transforming clinical thinking, resulting in an insufficient conversion rate of clinical thinking. Such a disconnection between theory and practice seriously affects the quality of nursing education and is not conducive to cultivating professional nursing talents who can meet the actual needs of clinical practice.

4.1.2. Lack of a hierarchical and progressive system

There is a lack of a hierarchical and progressive system in nursing education, which is prominently reflected in the training of nursing interns at different academic levels. The training standards for interns of various academic backgrounds (such as technical secondary school, junior college, undergraduate, and postgraduate levels) are insufficiently matched with the demands of clinical critical care nursing, failing to fully align with the actual work requirements of emergency departments and surgical departments. For instance, in the fields of key skills and professional knowledge related to critical care nursing, existing training programs may be overly general or lack sufficient depth, leaving nursing interns with competency gaps when dealing with complex clinical situations [6]. At the same time, the construction of a post-competency model for nursing interns is still incomplete. The existing model fails to fully cover the core competency elements required for critical care nursing, such as emergency response capabilities, multidisciplinary team collaboration skills, and rapid assessment and decision-making abilities for acute conditions. This directly impacts the clinical practice effect and training quality of interns.

4.2. Problems in the allocation of teaching resources

4.2.1. Structural contradictions in teaching staff

The teaching staff in emergency and surgical critical care nursing education face an imbalance in the gradient

distribution of teaching capabilities, as reflected by data on both academic qualifications and clinical experience years. Some teachers, despite holding high academic degrees, lack sufficient clinical experience and practical case expertise, leading them to focus more on theory in teaching without providing adequate practical guidance to students [7]. Conversely, some teachers with rich clinical experience may have relatively lower academic qualifications, resulting in deficiencies in the systematic imparting of theoretical knowledge. This imbalance impairs teaching quality and hinders the cultivation of nursing talents with both solid theoretical foundations and proficient practical skills. The allocation of teaching resources has failed to effectively address this contradiction, preventing the teaching staff from fully exerting their potential and restricting the development of emergency and surgical critical care nursing education.

4.2.2. Lagging construction of informationized teaching platforms

In the education system, the lagging construction of informationized teaching platforms is a prominent issue in the allocation of teaching resources. Taking the application of nursing education in emergency and surgical critical care as an example, the use of technologies such as virtual reality (VR) for critical care training encounters numerous obstacles. On one hand, there is a shortage of hardware facilities—for instance, VR devices lack sufficient precision and stability, making it difficult to meet the needs of simulating complex clinical scenarios [8]. On the other hand, software development faces challenges, with a lack of high-quality teaching software that can perfectly synergize with hardware. The software content may be insufficiently rich or accurate, failing to truly replicate the practical operational processes and emergent situations in critical care nursing. This lag in the coordinated development of hardware and software seriously undermines the effective application of informationized teaching platforms in nursing education, restricts the improvement of teaching quality, and is not conducive to cultivating critical care nursing talents who can meet the actual demands of clinical practice.

5. Construction of nursing education development strategies

5.1. Optimization paths of the curriculum system

5.1.1. Modular curriculum development plan

Design an ABCDE hierarchical curriculum module based on clinical pathways, which needs to integrate actual clinical needs and nursing education objectives. ABCDE can correspond to different nursing stages or the severity of patients' conditions, respectively, making the curriculum content more targeted and systematic. For example, Module A can focus on basic nursing knowledge and skills in the initial stage of trauma emergency care, such as hemostasis and bandaging [9]. As the modules progress, Module C, for instance, can delve into complex nursing operations and key points of condition monitoring in the intensive care stage. Meanwhile, formulating vertical connection standards for trauma emergency care, intensive care, and rehabilitation nursing is crucial. Clarify the connection points of knowledge and skills at each stage to ensure students can smoothly transition from one stage to the next, achieve the coherence and completeness of knowledge, improve the quality of nursing education, and better meet the clinical needs of emergency and surgical critical care nursing.

5.1.2. Interdisciplinary joint training mechanism

Construct an interdisciplinary curriculum system integrating emergency medicine, nursing, and engineering, aiming to cultivate nursing talents with comprehensive capabilities in medical instrument operation and maintenance. This system integrates the core knowledge and skills of the three disciplines, enabling students to

fully understand the medical principles, nursing operations, and the application and maintenance of instruments involved in critical care nursing [10]. In terms of curriculum design, emphasis is placed on the integration of theory and practice. Through case analysis, simulation operations, and other methods, students can master knowledge and skills in practical scenarios. At the same time, strengthen the construction of the teaching team, encourage teachers to engage in interdisciplinary learning and research, and improve teaching quality. In addition, establish practical teaching bases to provide students with real clinical environments and opportunities to operate instruments, further enhancing their comprehensive capabilities to adapt to the development needs of emergency and surgical critical care nursing.

5.2. Innovative practices in teaching methods

5.2.1. Exploration of blended teaching models

The integration of Massive Open Online Courses (MOOCs) and flipped classrooms brings new opportunities for emergency skills training. MOOCs provide abundant online learning resources, including theoretical knowledge and operational demonstration videos, allowing students to arrange their learning progress independently. Flipped classrooms, on the other hand, utilize class time for practical operations, case discussions, and answering questions. This combination of online and offline methods can effectively improve students' learning enthusiasm and initiative. Meanwhile, establishing a reasonable online-offline class hour allocation model is essential. Class hours should be scientifically distributed according to the difficulty, key points of teaching content, and requirements of practical operations. For example, for some basic theoretical knowledge, online learning time can be appropriately increased; while for key emergency skill operations, sufficient offline practical class hours must be guaranteed to ensure students master them proficiently.

5.2.2. Reform of objective structured clinical examination (OSCE)

In the reform of the Objective Structured Clinical Examination (OSCE), a multi-station assessment system including emergency cart equipment operation and team collaboration should be designed. This multi-station assessment can more comprehensively examine students' comprehensive capabilities in emergency and surgical critical care nursing. At the same time, improve the weight distribution algorithm of assessment indicators, reasonably determine the weights of different assessment indicators, so that the assessment results can more accurately reflect students' actual levels. For example, appropriate weights should be given to the proficiency in emergency cart equipment operation, communication skills, and role assumption in team collaboration, etc. Through such reforms, the scientificity and effectiveness of the OSCE can be improved, better promoting the development of nursing education in the field of emergency and surgical critical care nursing.

5.3. Construction of quality evaluation system

5.3.1. Improvement of the Kirkpatrick evaluation model

When improving the Kirkpatrick evaluation model, the fourth-level outcome evaluation can be refined. Expand it from the traditional, relatively broad scope to dimensions such as patient prognosis indicators and medical cost control. Considering patient prognosis indicators can directly reflect the effect of nursing education in practical clinical applications, such as patients' recovery speed and complication rate. At the same time, the inclusion of the medical cost control dimension is also crucial, as it can measure whether nursing education rationally utilizes medical resources and avoids unnecessary waste while improving nursing quality. On this basis, construct a quantitative evaluation matrix and assign quantitative values to each dimension to more accurately and objectively

assess the effectiveness of nursing education, providing strong data support and decision-making basis for the further development of nursing education.

5.3.2. PDCA cycle quality improvement

To promote the development of nursing education, it is necessary to establish a quality evaluation system and apply the PDCA cycle for improvement. In terms of the construction of the quality evaluation system, multi-dimensional indicators such as the achievement of educational objectives, the improvement of students' capabilities, and the effect of clinical practice should be comprehensively considered. At the same time, establish a dynamic feedback mechanism based on adverse event analysis to promptly identify problems in the educational process. For PDCA cycle quality improvement, first determine the Plan based on the current educational situation and clinical needs; then implement (Do) the educational activities in strict accordance with the plan; next check (Check) the educational effect through the quality evaluation system; finally act (Act) by adjusting and optimizing the educational plan according to the inspection results, continuously improving the quality of nursing education to better apply it in emergency and surgical critical care nursing.

6. Conclusion

Nursing education plays a crucial role in emergency and surgical critical care nursing. The reform of its system is of key significance for improving the level of treatment. By continuously optimizing educational content and methods, it can better cultivate professional talents who meet the needs of critical care nursing. In the future, artificial intelligence-assisted teaching and the application of metaverse technology will become important research directions. These new technologies are expected to bring innovative teaching models and experiences to nursing education, further enhancing educational effectiveness. Meanwhile, people should adhere to a sustainable development path that combines standardization and personalization in nursing education. Standardization ensures the basic quality and norms of nursing education, while personalization can meet the learning needs and characteristics of different students. The two are complementary, jointly promoting the continuous development of nursing education in the field of critical care nursing and providing higher-quality nursing services for patients.

Disclosure statement

The author declares no conflict of interest.

References

[1] Hao YJ, 2023, Design and Practice of Online Teaching for Undergraduate "Critical Care Nursing" Based on the ARCS Motivation Model, thesis, Shanxi Medical University.

[2] Wang JJ, 2022, Research on the Application of Guided Feedback Based on the 3C Model in Practical Courses of Critical Care Nursing, thesis, Shanxi Medical University.

[3] Niu YF, 2023, Analysis of Early Influencing Factors for the Successful Application of High-Flow Nasal Cannula Oxygen Therapy in Critically Ill Patients, thesis, Lanzhou University.

[4] Li B, 2023, Application and Research of the "Learn First, Guide Later — Problem Evaluation" Teaching Model: Taking High School Functions as an Example, thesis, Central China Normal University.

[5] Li Y, 2021, Application and Research of Child Psychology in Children's Art Education, thesis, Shanxi Normal University.

[6] Wang J, Yang Y, Shen J, et al., 2021, Application and Practice of Workplace Experiential Teaching in Experimental Teaching of Critical Care Nursing. Chinese General Practice Nursing, 19(18): 2571–2573.

[7] Zhang JN, Zhao JN, Zhang YY, et al., 2025, Application of the PEIPRE Teaching Model for Critical Care Nursing in Vocational College Nursing Non-Commissioned Officers. Chinese Nursing Research, 37(20): 3761–3765.

[8] Yang J, Cao DF, Liu ZH, et al., 2025, Application of the Obstetric Critical Care MDRRT Learning Model in Nursing Teaching. China Continuing Medical Education, 14(9): 115–119.

[9] Zhang FL, 2024, Relevant Theories and Practical Applications of Critical Care Nursing. Chinese Journal of Tuberculosis and Respiratory Diseases, 46(3): 368.

[10] Fang L, Xu R, Li F, et al., 2022, Application of Humanistic Literacy Education in Teaching of Critical Care Nursing. Nursing Practice and Research, 19(14): 7.