

Research on Strategies for Integrating Pre-hospital Emergency Training into Higher Vocational Nursing Teaching from the Perspective of Job Requirements

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Abstract: As one of the first links in the public health emergency response system, pre-hospital emergency care directly affects whether seriously ill patients live or die. Currently, there are serious deficiencies in the pre-hospital emergency talent cultivation of higher vocational nursing education, such as a disconnect between teaching content and actual work, and a lack of integration of skill training and clinical thinking. Therefore, educators need to adjust the teaching system according to the needs of jobs at present. Based on the deep integration of pre-hospital emergency training and higher vocational nursing education, this paper presents the core concepts, analyzes the demands for job competencies, studies the current teaching situation, and systematically explores the necessity and feasibility of such integration. The three main directions for optimization are curriculum content, teaching models, and assessment systems; simultaneously, dual guarantees will be provided for faculty development and resource construction. This paper hopes to establish a job-competency-oriented education-job integration path and provide theoretical support and practical references for teaching reform in pre-hospital emergency care for higher vocational nursing students.

Keywords: Pre-hospital emergency care; Higher-vocational nursing; Job requirements; Teaching integration ; Education-job integration

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1. Introduction

Pre-hospital emergency care refers to the first medical assistance provided to people before they reach the hospital. Promptly and correctly organized rescue work can save lives. With the acceleration of urbanization and aging of the population in China, the demand for regular emergency services and responses to public health emergencies has been increasing steadily, and high-level professional expectations have been placed on pre-hospital emergency personnel. High-level vocational nursing education aims to train technically

proficient and skilled nurses who will serve as the main force for pre-hospital emergency teams after graduation. However, traditional nursing education focuses on in-hospital nursing knowledge. Pre-hospital emergency content is often spread across optional courses or thematic lectures without a system or job-targeted focus ^[1]. Therefore, students have difficulty adapting to the new environment in the emergency department. Therefore, in order to improve the quality of talent cultivation and conduct theoretical research on optimizing emergency education systems, a systematic integration strategy for pre-hospital emergency training and higher vocational nursing education based on actual job requirements should be explored.

2. Relevant concepts and theoretical foundations

2.1. Definition of core concepts

Pre-hospital emergency care refers to the first few minutes after a serious illness or injury occurs, when trained professionals provide immediate medical assistance and safely transport the patient to a hospital. The main characteristics are time pressure, environmental uncertainty, resource scarcity, and autonomous decision-making in intervention. Higher-vocational nursing education is a kind of higher vocational education that aims to cultivate high-quality, technically competent nursing personnel for primary-level medical and health institutions, and focuses equally on practical ability and professional literacy. Job requirements refer to all-around competence expectations for employees in terms of knowledge systems, operating skills, clinical thinking, communication and cooperation, and emergency handling. They connect education and work at the same time. Education-job integration refers to incorporating job competency standards into all links of curriculum design, teaching implementation, and assessment to achieve seamless alignment between school education and professional practice. In short, it is to reduce the gap between schools and workplaces and enable students to learn by doing and learn through doing.

2.2. Job-requirement-oriented theory

Based on the idea of competency-based education, job-requirement-oriented theory proposes that the goals and contents of vocational education should start with the competence demands of job positions. Based on the results of job analysis, identify the knowledge, skills, and attitudes required for the main work of the position, and then reverse-engineer teaching objectives and learning activities. In the area of pre-hospital emergency care, this theory requires educators to carry out fieldwork in emergency centers and emergency departments, investigate frequent emergency cases, common operations, and essential decision-making points, and convert abstract occupational norms into teachable and learnable curriculum components. Offer some ideas for teaching integration; change the logic from “What teachers can teach” to “What employers want,” and ensure that the direction and results of talent cultivation are effective.

2.3. Education-integration theory of education and employment

Under the policy system of industry-education integration, the four types of education-job integrated education theory are: objective integration, content integration, process integration, and evaluation integration. Objective integration needs to map job-competency goals to curriculum teaching goals equally. Content integration aims to turn typical job tasks into teaching projects or learning scenarios. Process integration advocates organizing teaching activities according to actual or simulated work processes. Evaluation integration puts forward using industrial norms as the basis for academic assessment. This

theory does not use the old way of “learning before doing,” but instead proposes a spiral growth model of alternating study and application. Education-job integration in pre-hospital emergency training simulates real-world workflows, such as dispatch command, on-site assessment, and team cooperation, to help students gain a deeper understanding of their future jobs during school ^[2].

3. Current status of pre-hospital emergency teaching in higher-vocational nursing and job requirements

3.1. Analysis of core competence requirements for pre-hospital emergency posts

The five types of core competency requirements for pre-hospital emergency practitioners are: rapid assessment and decision-making; basic and advanced life-support operations; on-site management of trauma hemostasis, bandaging, immobilization, and transportation; team communication and dispatch coordination; stress, psychological adjustment, and self-protection. Based on the text analysis of job descriptions for local emergency centers, emergency nurses need to complete all steps of the workflow independently during off-duty hours, such as assessing the scene’s safety, making an initial diagnosis, providing emergency treatment, and deciding whether to transfer, within about 8-12 minutes; thus, they require excellent clinical judgment and proficient procedural skills. In addition, there are many unpredictable circumstances in emergencies, such as traffic accident scenes, residential areas, and public gathering places; therefore, multi-skilled training in traditional nursing education, such as intravenous injection and vital sign observation, is no longer sufficient.

3.2. Investigation of pre-hospital emergency teaching in higher vocational nursing

Based on the current teaching situation, three typical higher vocational colleges with nursing programs in the province were selected for this study. Talent-training schemes, curriculum norms, and interviews with professional teachers were analyzed to organize pre-hospital emergency teaching implementation. Research shows that most pre-hospital emergency content is taught by emergency nurses or critical-care nurses, and the average number of theoretical class hours is around 12–18, with no more than 8 practical class hours. Practical training focuses on isolated skills, such as cardiopulmonary resuscitation and bag-valve-mask ventilation, and lacks systematic drills of full emergency workflows. Most of the interviewed teachers do not have first-hand experience in front-line pre-hospital emergency work, and their teaching cases are based on textbooks or second-hand materials without real-life situations. Interns are rarely involved in actual emergency calls or rescue work during their internship and are mainly observers. In short, the current teaching mode has fragmented knowledge, isolated skills, and virtualized scenarios, and fails to help students form a complete pre-hospital emergency response system.

3.3. Adaptability gaps between teaching and work requirements

Misalignment between teaching and job demands is shown by inconsistent goals, a lack of relevant content, and outdated assessments. Most of the objectives at the objective level focus on learning basic emergency skills, but posts require all-around competence to handle emergencies independently in complex and changing environments; thus, there is a hierarchy gap. At the content level, pre-hospital-specific components such as on-site safety control, triage, and telemedicine cooperation are rarely covered, and many class hours are spent on procedures that are used infrequently in actual work, resulting in a low correlation between teaching content and real-life applications. Existing evaluations focus on operational standardization at the

assessment stage and fail to provide effective measurement instruments for job-critical attributes such as emergency decision-making ability, humanistic care, and teamwork. Therefore, although the students have passed the course exams, they will be unable to handle real-world out-of-class assignments.

4. Necessity and feasibility of integrating pre-hospital emergency training with nursing teaching

4.1. Necessity of job-curriculum integration for talent cultivation

Socially, the number of annual pre-hospital emergency outcalls in local cities keeps rising, and there is a continuous shortage of emergency doctors and nurses. Graduates of high-level vocational nursing programs are now the main supply of frontline emergency staff. However, due to a lack of coordination between institutional education and on-the-job training, new hires take a long time to adapt and have a relatively low pass rate for independent post-assessments; thus, both manpower costs and operating risks for the emergency system increase indirectly. Fragmented pre-hospital education does not meet the professional development needs of students. Many graduates need to relearn basic skills such as off-site evaluation, doctor-patient communication, and urgent airway management after starting work, which is an indirect loss of educational investment. Therefore, promoting pre-hospital emergency training and integrating it into higher-vocational nursing education is an unavoidable path to reduce the period of job adaptation and enhance the talent-training efficiency at its origin ^[3].

4.2. Foundational conditions for teaching integration

Mature Conditions Support Current Teaching-Integration Practices: Politically, national documents issued by the Ministry of Education on deepening industry-education integration encourage industry and enterprises to participate in the formulation of teaching standards and provide institutional support for cooperation between emergency centers and colleges. Technologically, high-fidelity simulators, virtual-reality emergency training systems, and online case libraries are becoming more accessible. They can create various difficult pre-hospital emergency situations and other problems at the university level to compensate for the lack of real-life practice opportunities. In terms of faculty, enhanced cultivation of dual-competency teachers can help colleges strengthen instructors' practical abilities by organizing off-campus training sessions and part-time work for emergency center staff. Some colleges have been developing their own curricula and school-enterprise cooperation models.

4.3. Core values of teaching integration

Teaching Integration Creates Values at Three Levels: Talent cultivation builds a step-by-step competence-development path of cognition-simulation-practice to enable students to move from knowledge acquisition to internalized emergency thinking, thus allowing graduates to take up positions and work effectively after graduation. Integration promotes the transformation of the curriculum system from static knowledge transmission to dynamic competence construction, drives renewal in teaching content and pedagogy, innovates assessment, and improves the overall quality of programs. Industrial development provides stable talent co-cultivation channels for colleges and emergency institutions, reduces the cycle of pre-service training for new emergency staff, lowers social manpower-training costs, reserves talents for standardized emergency-technique promotion and continuous quality improvement, and achieves significant public-health

benefits.

5. Integration strategies of pre-hospital emergency training and nursing teaching based on job requirements

5.1. Curriculum-content optimization based on job standards

Optimization of curriculum content should directly reference pre-hospital emergency job competence standards and build a progressive curriculum consisting of basic, core, and extended modules. The general module will cover all nursing students and provide them with general emergency skills, such as CPR and airway management, hemostasis, bandaging, immobilization, transport, and recognition of common acute diseases, etc., so everyone can learn them. The main module will focus on the specific work of emergency nurses, such as on-site command for mass-casualty incidents, advanced life-support teamwork, emergency documentation and information reporting, and use project-based learning for content organization. The extended module is for students who wish to pursue careers in emergency services; it offers special courses such as pre-hospital trauma life support and pediatric emergency care and is in line with certification programs organized by emergency centers. At the same time, a dynamic content-updating mechanism will be introduced to adjust teaching priorities annually based on feedback from emergency centers about changes in job requirements and keep the content relevant to practice.

5.2. Teaching model innovation in line with job scenarios

Teaching-model innovation aims to overcome spatial-temporal barriers between classrooms and workplaces, and promotes immersive pedagogy based on scenarios, tasks, and reflections. Authentic emergency cases will be used to create teaching situations. High-fidelity simulation equipment has been built to recreate accident scenes, residential areas, and ambulance bays, and students can carry out the entire task chain of alarm reception and mission dispatch, on-site intervention, and handover during transportation in a high-pressure simulated environment. Contingency variables, such as equipment failure, agitated family members, and sudden patient deterioration, are added to train emergency decision-making and psychological resilience. Authentic work materials, such as emergency center dispatch records and in-ambulance videos, can also be used for teaching discussions. Invite front-line emergency workers to give class talks and bring real-life scenarios into the classroom to help students feel more involved in their studies.

5.3. Reconstruction of assessment systems based on job competency

The reconstruction of the assessment system should give equal weight to process-oriented and summative evaluations, integrate skill assessment with scenario-based assessment, and establish multi-dimensional evaluation mechanisms based on job competence. In addition to the standardized single-procedure test, other forms of skills tests are also available. Students need to complete all the steps of the emergency workflow in a short amount of time, including assessment, intervention, communication, and documentation, and this will be jointly graded by college teachers and emergency center mentors. Competency-based rating scales for pre-hospital emergency posts have been developed to evaluate the dimensions of rationality in clinical decision-making, efficiency and standardization of operations, effectiveness of team communication, and performance in humanistic care. Continuous records of individual competence growth are obtained by accumulating results from multiple simulation drills. In addition, some parts of the pre-service certification examination at

emergency centers can be incorporated into institutional assessments to promote closer cooperation between academic evaluation and occupational entry, enhance students' employment competitiveness and professional confidence, etc. ^[4].

6. Implementation guarantees and prospects of integrated teaching

6.1. Guarantee for faculty capacity improvement

The faculty's ability will directly affect the implementation of integrated teaching. A training-practice-research trinity teacher development system should be built. Colleges should develop special training plans for emergency-teaching staff, regularly select key teachers to take part in no less than a two-week full-time on-post practice at emergency centers, fully participate in out-call missions, dispatch and quality control, and gain an in-depth understanding of the actual job logic. Joint teaching-research mechanisms will be established by emergency-center specialists and college instructors to hold monthly collective lesson preparations, case studies, and teaching peer reviews to supplement theoretical instruction with practical guidance. Teachers are motivated to participate in emergency skill competitions and revisions of industrial standards to stay informed about new developments in the cutting-edge industry. In addition, special teaching-reform research projects will be organized to help teachers carry out action research on the problems in integrated teaching, improve teaching quality through research, and promote the spiral development of faculty competence.

6.2. Guarantee for practical training resource construction

The three requirements for practical-training resources are: high-fidelity simulation, systematic completeness, and openness. Fidelity requires building high-fidelity pre-hospital emergency training rooms equipped with emergency mannequins, defibrillators, ventilators, and monitors, as well as audio-video recording-and-playback systems for full-process documentation and debriefing of emergency drills. Systematic completeness demands the construction of online-offline integrated teaching-resource banks, which should include typical emergency case databases, operation video libraries, question banks, and virtual simulation training software for both self-directed learning and flexible teaching. Openness will allow the training facilities to participate in the service personnel training and skills competition organized by the emergency center, achieving school-enterprise facility sharing and resource circulation. Colleges need to set aside special construction funds for the staged renovation of training rooms and establish equipment maintenance-replacement mechanisms to maintain good practical training conditions according to industrial changes.

6.3. Expected results and prospects of integrated teaching

Integrated teaching after implementation will likely achieve many positive results. All-round pre-hospital emergency capabilities for students will be strengthened; the cycle of job adaptation will be reduced, and the first-time pass rate for independent post-assessments will rise significantly. Teachers' dual-competency quality will be improved, and a stable school-enterprise dual-collaboration mechanism for emergency-teaching teams will be established. Academic programs will gain wider social recognition and higher employment rates for nursing majors in emergency care, creating unique institutional brands. In the long run, successful integrated teaching practices can be expanded to community first-aid training and public dissemination of emergency knowledge, thereby exercising the colleges' social service function. Future studies will continuously collect data on the career development of graduates for longitudinal effect

evaluation, iteratively optimize integration strategies, and explore the construction of regional emergency education alliances to promote the integration of teaching standards and industrial standards^[5].

7. Conclusion

In-depth integration of pre-hospital emergency training and higher vocational nursing education is a system of projects that responds to the demand for enhanced social emergency service capabilities and addresses the mismatch between talent cultivation and job requirements. Based on the job requirements, this study will systematically present the necessity, feasibility, and implementation path of integration, and put forward a three-dimensional strategy system covering curriculum, teaching and assessment, as well as support guarantee mechanisms. Integration should not be mistaken for the addition of more emergency courses. Therefore, it is necessary to reform the logical framework of teaching objectives based on job competence, rebuild teaching-process ecosystems according to real-life scenarios, and restructure assessment criteria focused on competence development. Only when educators incorporate job-post standards into all stages of teaching can they achieve the goal of “learning for application and competence upon assignment,” and provide more high-quality technically skilled nursing personnel for pre-hospital emergency services.

Disclosure statement

The authors declare no conflict of interest.

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