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Innovation and Practice Research on the Modern Apprenticeship Training Model for Nursing Talents Integrating General-Specialty Integration, Moral-Technical Fusion, and Specialty-Innovation Union

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Abstract: Modern apprenticeship emphasizes strengthening school-enterprise cooperation, deepening the integration of production and education, and promoting the combination of work and study to achieve seamless connection between professional education and industrial needs, thereby improving the quality of talent training. This paper analyzes the current problems in the nursing talent training system, elaborates on the significance of cultivating nursing talents based on modern apprenticeship, and proposes new ideas for constructing a modern apprenticeship training model for nursing talents from the perspectives of "integrating general and specialized education, merging virtue and skills, and linking specialization and innovation". The aim is to further promote the organic combination of nursing talent training goals and post needs, for reference only.

Keywords: Integration of general and specialized education; Merging of virtue and skills; Linking of specialization and innovation; Nursing talent training; Modern apprenticeship

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1. Introduction

With the continuous advancement of the "Healthy China 2030" strategy, China's medical and health industry has achieved rapid development. Under this situation, Shanghai has built a number of high-level hospitals and developed a number of high-level clinical specialist medical services, which are in urgent need of "Clinical Nurse Specialists (CNS)" who possess advanced nursing capabilities in a specific clinical specialty, medical-engineering integration innovation capabilities, and technology transfer capabilities. A "Clinical Nurse Specialist (CNS)" refers

to a nurse who has strong theoretical knowledge and exquisite practical skills in a certain clinical nursing field and can directly provide high-quality nursing services to patients. At present, the training, assessment, and certification of "Clinical Nurse Specialists" in China are mainly targeted at post-service nurses, requiring more than 5 years of hospital work experience and training by specialized institutions such as the Chinese Nursing Association and the Shanghai Nursing Association. There is no talent training model for cultivating "Clinical Nurse Specialists" through pre-service courses in colleges and universities. The problems existing between this training system and industry needs have further exacerbated the contradiction between talent supply and demand [1]. Strengthening the training of nursing talents based on modern apprenticeship can accurately meet industry needs, effectively solve the imbalance between supply and demand of nursing talents, and help provide solid talent support for the steady advancement of the "Healthy China 2030" strategy. Therefore, it is necessary for higher vocational colleges to actively explore the innovative practical paths of the modern apprenticeship training model for nursing talents, so as to output more outstanding nursing talents that meet the actual needs for the high-quality development of the nursing industry.

2. Current problems in the nursing talent training system

2.1. Disconnection between talent training goals and the demand for advanced nursing capabilities of "clinical nurse specialists"

With the growing health needs of people, nursing specialization has now become an important strategic direction for the development of clinical nursing practice. The National Health Commission emphasized in the notice on further strengthening nursing work in medical institutions: medical institutions should, according to their functional positioning and task requirements, combined with the development of medical technology and patients' nursing needs, strengthen the construction of nurses' specialist nursing capabilities [2]. In July 2023, the Shanghai Municipal Health Commission formulated and issued the Shanghai Action Plan for Further Improving Nursing Services (2023—2025) (Hu Wei Yi (2023) No. 50). The notice mentioned that medical institutions should take "three basics and three strictes" as the starting point, strengthen and implement nurses' basic "general + specialist" nursing operation skills, ensure nursing quality, better meet patients' clinical nursing needs, and improve patients' medical experience [3].

At present, the training of "Clinical Nurse Specialists" in China has long relied on post-service continuing education. A 2025 survey of nursing experts, nursing managers, and nursing staff in 30 hospitals in Shanghai showed that there is a significant structural shortage of nursing talents in specialist fields such as geriatric nursing, intensive care, and emergency nursing in Shanghai. However, due to the time limit of the three-year general higher vocational nursing program, it can only cultivate talents with basic general nursing capabilities, which cannot meet the special advanced nursing capability requirements of clinical specialist nurses, thereby exacerbating the contradiction of "urgent talent demand but insufficient supply".

2.2. Insufficient connection between the practical teaching system and the requirements for "virtue and skill integration" of "clinical nurse specialists"

The traditional nursing talent training system focuses more on the cultivation of professional skills and lacks the setting of systematic paths for improving nursing professional literacy, making it difficult for students to understand and inherit the craftsman spirit of excellent clinical nurses. This easily leads to new nurses lacking

professional identity and pride, resulting in relatively poor employment stability of students [4]. The China Health and Medical Development Report shows that the overall turnover rate of nurses in China is between 10.2% and 11.2%, among which as many as 56.94% have the intention to resign. The core reasons are mainly the lack of professional identity and pride of new nurses [5]. It can be seen that how to cultivate the nursing craftsman spirit in the teaching practice process and build a nursing talent training system of "merging virtue and skills" has become a key proposition to improve the professional stability of nurses [6].

2.3. Weak support of teachers' teaching capabilities for the cultivation of innovative practical capabilities of "clinical nurse specialists"

Nowadays, the development of new quality productive forces is promoting the transformation and upgrading of the nursing industry towards intelligence, which requires nurses not only to complete basic nursing operations but also to have the ability to discover clinical problems and solve them with innovative thinking. Studies have shown that the improvement of nurses' innovative capabilities can improve the quality of patient care, shorten the length of hospital stay, reduce medical expenses, and even reduce patient mortality.

However, the construction of nursing faculty in current higher vocational colleges has dual limitations: first, most colleges focus on skill training and ignore the cultivation of innovative thinking; second, a few colleges that carry out innovation and entrepreneurship education mostly focus on competition guidance and fail to deeply integrate with the nursing profession. Obviously, this traditional single-discipline faculty structure is difficult to fully meet the high requirements of training new nursing talents of "medical-engineering integration" and "specialization-innovation integration", and cannot support the cultivation of students' innovative practical capabilities.

3. Significance of cultivating nursing talents based on modern apprenticeship

3.1. Conducive to meeting strategic core needs and making up for the shortage of nursing talent supply

Modern apprenticeship, with the model of "enrollment is employment and admission is onboarding", can effectively promote the precise connection between talent training and industry needs [7]. In practice, schools and enterprises jointly formulate nursing talent training programs and set targeted curriculum modules according to the needs of the entire cycle of health services, such as geriatric chronic disease management and home care, to directionally cultivate outstanding nursing talents more in line with the needs of specific fields. This customized talent training model not only expands the effective supply of nursing talents but also optimizes the talent structure of the nursing industry, which is conducive to providing sufficient talent support and guarantee for the implementation of the "Healthy China 2030" strategy.

3.2. Conducive to improving the quality of talent training and strengthening core health service capabilities

Adhering to the core educational concept of "learning by doing and doing by learning", modern apprenticeship integrates theoretical knowledge into real clinical practice scenarios through the collaborative guidance of "dual tutors", thereby realizing the imparting of knowledge and skills [8]. On the one hand, on-campus teachers are responsible for systematically explaining professional theories and basic skills to students. On the other hand,

clinical tutors guide students to carry out practical skill training combined with real cases, cultivating their clinical thinking and problem-solving abilities. At the same time, in the practice process, students can directly contact the full-life-cycle health needs of patients, deeply understand the connotation of humanistic care, and gradually improve their communication and psychological nursing abilities. This can greatly strengthen students' core health service capabilities and help improve the quality of school talent training [9].

4. Innovation and practice of the modern apprenticeship training model for nursing talents integrating general and specialized education, merging virtue and skills, and linking specialization and innovation

4.1. Establish a "general-specialized integration" through-train modern apprenticeship training model to cultivate advanced nursing capabilities

In response to the changes in the ability requirements of new nurses brought about by the upgrading of clinical nursing ability needs (emphasizing specialized nursing capabilities, medical-engineering integration innovation capabilities, and technology transfer capabilities), schools need to take post talent demand research as the starting point and clarify ability training goals with reference to national professional standards [10]. In practice, relying on the advantage of the five-year long academic system, schools can design a five-stage progressive training path of "nursing student → apprentice → prospective nurse → general practice nurse → specialist nurse" around the post ability requirements of "Clinical Nurse Specialists", and ensure its implementation through "three dual collaborations" (see **Figure 1**).

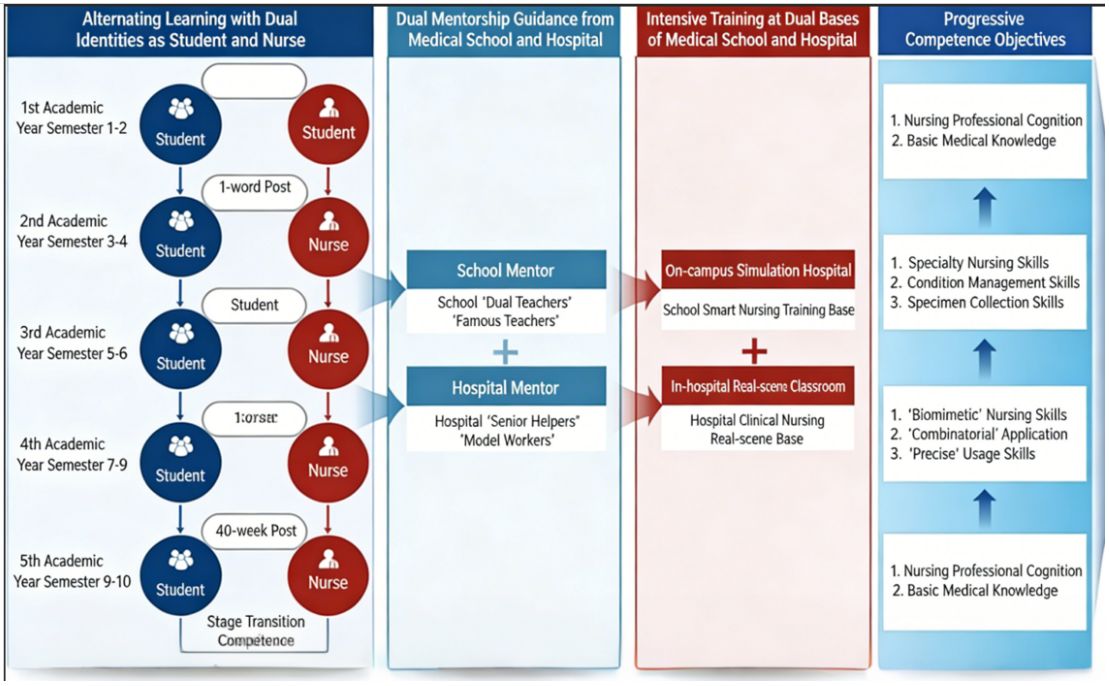

Figure 1. Modern apprenticeship ability training of "three dual collaborations, five-stage progression, and integration of general and specialized education".

First, dual identity recognition: new students are jointly selected by both medical and school parties after enrollment to realize "enrollment is employment", and students have dual identities as "on-campus students" and

"hospital apprentices". Second, dual tutor configuration: school tutors are "double-qualified" teachers with more than 5 years of teaching experience and intermediate or above professional titles, and hospital tutors are excellent nurses with more than 5 years of clinical experience and holding nurse or above qualifications, providing full-cycle collaborative guidance. Third, dual base support: build a "simulated hospital" on campus and set up "training classrooms" in hospitals to achieve seamless connection between "on-campus simulation training + clinical real practice".

In addition, in response to the nurse qualification examination, schools need to put forward a rigid requirement of 32 weeks of clinical internship, adopt the "work-study alternation" model to coordinate teaching and practice. In the first three years, students' general nursing theories and basic skills are cultivated; in the fourth year, arrange 36 weeks of general practice internship, and encourage students to take the national nurse qualification examination in advance to achieve "holding certificates while in school"; in the fifth year, arrange students to conduct specialized internship according to the specialist needs of hospitals (such as geriatrics, critical care medicine) to specialize in specialized nursing skills, so that students can have the on-the-job ability of "Clinical Nurse Specialists" upon graduation.

4.2. Construct a "virtue-skill integration" practical system to cultivate "clinical nurse specialists" with high virtue and strong skills

Following the concept of "early clinical practice, more clinical practice, and repeated clinical practice", the school designs a "five-stage skill progression + three-level literacy improvement" system to simultaneously strengthen skills and morality (see **Figure 2**).

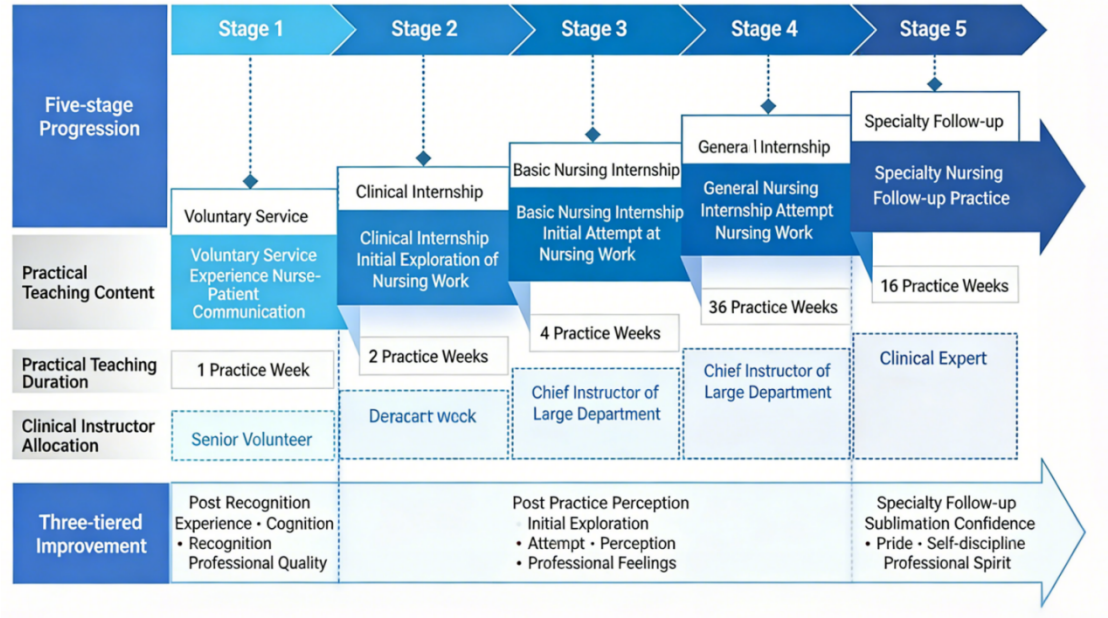

Figure 2. Practical system of "five-stage progression, three-level improvement, and merging of virtue and skills".

Five-stage skill progression: 1 week of hospital volunteer service in the first academic year (experiencing nurse-patient communication and completing the role transformation of nursing students), 2 weeks of clinical probation in the second academic year (exploring nursing processes and completing the role transformation of apprentices), 4 weeks of daily nursing internship in the third academic year (trying basic operations and

completing the role transformation of prospective nurses), 36 weeks of general practice internship in the fourth academic year (mastering comprehensive skills and consolidating the role identity of prospective nurses), and 16 weeks of specialized on-the-job training in the fifth academic year (refining specialized capabilities) [11].

Three-level literacy improvement: match a five-stage tutor team of "senior volunteers → department instructors → general department chief instructors → excellent instructors → clinical experts" for full-cycle companionship. Let students learn from senior volunteers their attitudes towards life, diseases, and patients to cultivate empathy; learn nursing professional norms and rigorous professional spirit from department instructors; perceive professional identity, correct values, and work spirit from general department chief instructors; learn to be patient-centered and fulfill the original mission of medical workers from excellent instructors; learn the qualities of dedication, focus, and innovative breakthroughs from clinical nursing experts. Tutors guide students to achieve the cultivation of three-level qualities through "post recognition (cognitive professional value) → post practice (practicing professional norms) → post assignment (inheriting professional spirit)", enabling them to gradually form empathy, professional identity, and craftsman spirit [12].

4.3. Establish a "specialization-innovation linkage" teacher studio to cultivate innovative "clinical nurse specialists"

With the update of medical and nursing technology, the clinical frontline proposes to promote the high-quality development of smart nursing with new quality productive forces [13]. To this end, schools need to reconstruct and integrate educational logic and industrial logic based on the concept of two-way integration of production and education, integrate the nursing profession with innovation and entrepreneurship, establish a cross-border team of "medical-school dual tutors + innovation and entrepreneurship teachers + enterprise engineers", and build a "three-stage incubation" innovation training mechanism (see **Figure 3**).

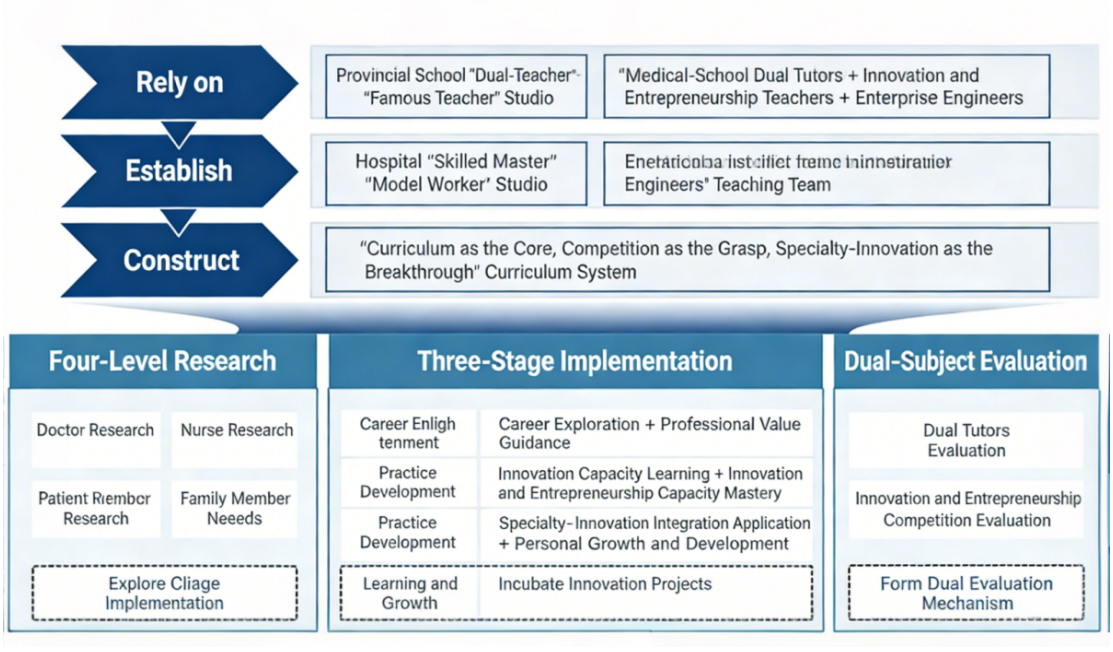

Figure 3. Faculty team development model of "three-teacher collaboration, three-stage incubation, and specialization-innovation linkage".

Career enlightenment stage (first academic year): stimulate students' innovative awareness through "nursing career cognition + innovation and entrepreneurship concept introduction" courses combined with clinical case analysis. Learning and growth stage (second to fourth academic years): carry out four-dimensional clinical demand surveys of "doctors–nurses–patients–family members", and take "curriculum projects + skill competitions" as carriers to cultivate students' innovative thinking and practical abilities. For example, rely on the "Internet +" College Student Innovation and Entrepreneurship Competition and the World Vocational College Skills Competition to incubate innovative projects [14]. Practice and development stage (fifth academic year): apply mature innovative projects (such as the improvement of nursing auxiliary equipment, the optimization of smart nursing processes) to clinical practice, feedback hospital nursing work, and enhance students' professional pride. At the same time, the school needs to establish a "dual-subject evaluation" system, where medical and school dual tutors evaluate from the dimensions of professional ability and innovative potential, and the organizing committee of innovation and entrepreneurship competitions scores from the dimensions of project practicality and innovation to comprehensively ensure the quality of talent training [15].

5. Conclusion

In summary, higher vocational colleges' strengthening of nursing talent training based on modern apprenticeship can improve the accuracy and effectiveness of talent training. In the future, schools need to continue to deepen school-enterprise collaboration, deeply integrate hospital new nurse training courses with the five-year through-train teaching system, shorten the adaptation period of students after employment, enhance their sense of professional gain, and further expand specialist directions, so as to better meet industry needs and continuously output high-quality innovative nursing talents for China's medical and health institutions, pharmaceutical enterprises, etc.

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