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Application of a training program system centered on job competency in the standardized training of new nurses



Fenglian Luo^{1*}, Jun Cai², Haixia Ma¹, Xia Wu¹ and Yue Xia¹

Abstract

Objective This study investigates the effectiveness of a job competency-centered training system for newly hired nurses during their induction training.

Methods The control group included 41 nurses who underwent traditional teaching models from 2020 to 2021. The observation group consisted of 39 nurses trained from 2022 to 2024, focusing on job competency. This training covered basic theoretical knowledge, operational skills, professional conduct, communication, emergency response, and comprehensive nursing care skills. Post-training evaluations included competency, theoretical and practical examination scores, Nursing-Mini-CEX excellence rates, patient satisfaction, and humanistic care abilities.

Results The observation group achieved higher scores across all assessment areas compared to the control group. Theoretical examination scores were (95.987 ± 2.129) vs. (94.756 ± 2.773), practical scores were (96.987 ± 1.254) vs. (95.902 ± 1.855), and comprehensive scores were (96.487 ± 1.234) vs. (95.329 ± 1.841). Mini-Clinical Evaluation Exercise (Mini-CEX) scores were (8.795 ± 0.409) for the observation group and (8.439 ± 0.594) for the control group. In job competency dimensions, the observation group scored: professional quality (10), general work capability (34.718 ± 0.916), communication and coordination (13.949 ± 0.605), proactive management (13.974 ± 0.778), patient safety (14.128 ± 0.767), health education (8.564 ± 0.552), and overall competency (95.333 ± 1.420). Conversely, the control group scored: professional quality (10), general work capability (34.268 ± 0.708), communication and coordination (13.634 ± 0.733), proactive management (13.634 ± 0.733), patient safety (13.780 ± 0.725), health education (8.293 ± 0.599), and overall competency (93.610 ± 1.481). For humanistic care ability, the observation group had cognitive (66.41 ± 3.362), courage (65.923 ± 3.115), and patience dimensions (60.308 ± 3.686), totaling (192.641 ± 5.451). The control group's scores were cognitive (64.488 ± 3.543), courage (64.317 ± 3.446), and patience (57.902 ± 5.004), totaling (186.707 ± 8.143). Patient satisfaction rates were 100% in the observation group and 95.12% in the control group. Nurses trained under the competency-based model showed significant enhancements in job competency, patient satisfaction, and humanistic care compared to those trained under traditional methods.

Conclusion The job competency-centered induction training model significantly enhances new nurses' job competence, theoretical and practical assessment scores, humanistic care abilities, and patient satisfaction compared to traditional models.

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Keywords Job competency, Standardized training, New nurse, Application

Introduction

The standardized training of new nurses is paramount in today's rapidly evolving healthcare environment, as newly hired nurses constitute a critical component of the hospital's nursing team. The quality of their service directly impacts the provision of clinical care and patient safety [1]. However, new nurses' diverse educational backgrounds and varying competency levels among new nurses highlight the urgent need for targeted training programs [2, 3]. Currently, many nurses undergoing standardized training lack the opportunity to practice in their assigned units, potentially resulting in discrepancies in their understanding of the hospital culture and the intricacies of clinical work [4, 5]. This challenges them to attain competence in clinical nursing tasks quickly. Therefore, it is essential to implement job competencycentered induction training, which focuses on equipping new nurses with the necessary skills and knowledge to thrive in the clinical setting [6, 7].

Job competency is defined as the comprehensive amalgamation of knowledge, skills, and attitudes required by nurses to effectively perform their tasks in a specific role [8, 9]. This encompasses a broad spectrum of clinical nursing skills, professional ethics, career development, teamwork, critical thinking, communication and interpersonal skills, information processing capabilities, clinical decision-making abilities, and self-learning capacity [10, 11]. Traditional training programs have often overemphasized theoretical knowledge while neglecting the cultivation of essential service attitudes and professional responsibility, which are crucial for comprehensive nursing services [12, 13]. In contemporary society, the demand for nursing services extends beyond professional skills and theoretical knowledge; it places a greater emphasis on the service attitude and professional spirit of nursing personnel. This has resulted in the outcomes of previous training efforts being less than ideal [14].

Standardized training focused on job competency equips new nurses with essential clinical knowledge and skills, enabling swift adaptation to the work environment. It fosters professional development and enhances adaptability in clinical situations, including effective communication and teamwork [15–17]. Currently, the new nurse training models in our country are still in their early stages of development, lacking standardized training outlines and evaluation systems [18, 19]. The training and assessment of new nurses are based primarily on basic business knowledge, skill levels, and daily work performance, while other assessment elements are often neglected [20]. In this study, we adopted a method that integrates job competency with standardized training to explore more effective training approaches. Our aim was to investigate the effectiveness of a job competency-centered training system for newly hired nurses during their induction training. This approach ensures alignment with the actual work needs of nurses, thereby enhancing the specificity and effectiveness of the training and ultimately improving clinical job competency.

Subjects and methods

Subjects

The study subjects were new nurses who enrolled in the standardized induction training program in the hematology department of the Second Affiliated Hospital of Chongqing Medical University, a teaching hospital located in Chongqing, China, from 2020 to 2024. They were divided into an observation group and a control group using the group comparison method. Convenience sampling was used to select the participants for both groups. as all new nurses undergoing standardized training during the specified periods were included in the study. The sample size was determined based on previous literature [21] and the availability of new nurses during the study period. Nurses who joined the program from 2020 to 2021 were assigned to the control group and received training through traditional teaching methods. The control group was comprised of 41 individuals. The age group was 22(21-26) years. Among them, 4 were male and 37 were female, consisting of 7 with a bachelor's degree and 34 with a Junior college. Nurses who joined the program from 2022 to 2024 were chosen for the observation group and underwent a new nurse induction training plan focused on job competency. The observation group included 39 individuals. The age of the observation group was 22(20-26) years; the group consisted of 3 males and 36 females, with 5 holding a bachelor's degree and 34 with a Junior college. There were no statistically significant differences between the two groups of new nurses in terms of age (P = 0.922), gender (P = 0.744), and educational background (P = 0.594), demonstrating comparability, as detailed in Table 1.

Inclusion Criteria: (1) Nurses who have recently assumed a nursing position after graduating from college or university; (2) Those who have successfully passed the hospital's standardized training entrance examination and obtained a nursing qualification certificate during the training period; (3) Individuals who are newly employed, undergoing standardized training, and lack work experience; (4) Individuals who have signed an informed consent form and expressed willingness to participate in this study. Exclusion Criteria: (1) Nurses with prior work experience; (2) Individuals who interrupt their training

Table 1 General information of new nurses

Parameter		Observa- tion group (n=39)	Control group (n=41)	P-Valve
Age(year)		22(20-26)	22(20-26)	P=0.922
Gender	Male	3/39(7.69%)	5/41(12.20%)	P=0.744
	Female	36/39(92.31%)	36/41(87.80%)	
Academic qualifications	Bachelor's degree	5/39(12.82%)	7/41(17.07%)	P=0.594
	Junior college	34/39(87.18%)	34/41(82.93%)	

prematurely. Two new nurses in this study were terminated due to medical reasons, resulting in a total of 80 new nurses enrolled in this study.

Methods

Control group

The training was implemented using conventional methods. New nurses were recruited through a standardized process, ensuring a diverse representation of backgrounds. Upon joining the department, they underwent training based on the nursing department's standardized training plan. The primary mode of instruction consisted of centralized lectures covering hospital overview, nursing safety management, risk prevention, communication, basic theoretical knowledge, and operational skills. The training lacked elements specifically targeting job competency, focusing instead on general skills. Practical learning was guided by the head nurse and teaching team leaders, with a 6-month rotation period, followed by an assessment upon completion.

Observation group

The training was carried out using a standardized training plan focused on nursing job competency, guided by the nursing department's uniformly developed training plan. The pedagogical framework for the training was based on Bloom's taxonomy [22], which emphasizes the development of cognitive, affective, and psychomotor skills. This framework ensured that the training not only covered theoretical knowledge but also focused on practical skills and professional attitudes, enabling new nurses to achieve a comprehensive understanding of their roles and responsibilities. The recruitment process was identical to that of the control group to minimize selection bias, although being limited to a single hospital may introduce institutional biases. The hospital training team assumed responsibility for the daily quality control and management of training for newly hired nurses. The implementation of the training and teaching was overseen by department head nurses, teaching team leaders, and clinical mentors.

The training content mainly includes (1) Department Introduction: A comprehensive introduction to the department's fundamentals, rules and regulations, job responsibilities, workflow, and emergency preparedness plans. (2) Specialty Theoretical Knowledge: Encompasses the etiology, symptoms, signs, treatment principles, nursing assessment, condition observation, and critical treatment points for common hematological diseases. (3) Specialty Techniques: Incorporates special medication preparation, blood transfusion techniques, and PICC line maintenance, among others. (4) Critical Thinking Skills: Cultivation of critical thinking skills through Problem-Based Learning (PBL) and other methodologies. (5) Training in Teamwork and Communication Skills: Regularly conducts nursing safety simulations to foster a collegial team atmosphere and promote open communication. (6) Comprehensive Ability Training: Primarily employs a combination of Nursing-Mini-CEX and clinical practice to enhance humanistic care and sense of responsibility and to improve the quality of nursing services, as detailed in Figure S1.

The nursing department established a training manual. During the rotation period, clinical mentors were assigned by each department for one-on-one followup teaching and guidance, dynamically monitoring the nurses' work performance and providing timely, targeted feedback or suggestions. The rotation period lasts 6 months, at the end of which the training manual is completed, and assessments are conducted accordingly.

Evaluation

Job competency

The job competency of both groups of new nurses is assessed based on the evaluation standards issued by the nursing department before the new nurses' independent duty. The assessment covers six dimensions: professional quality, general work capability, communication and coordination ability, proactive management ability, patient safety ability, and health education ability. A Likert 5-point scoring method is employed, with 0 points indicating no ability, 1 point indicating minimal ability, 2 points indicating some ability, 3 points indicating sufficient ability, and 4 points indicating a high level of ability. The total score ranges from 0 to 100 points, with higher scores indicating greater job competency [23].

Theoretical knowledge examination and skills assessment

The theoretical examination comprises objective questions and is conducted as a closed-book exam with custom test papers prepared by the department, with a total score of 100 points. The skills assessment includes both basic operations and specialty skill operations, with oversight from teaching team leaders and head nurses. Scores are positively correlated with the capability in these areas.

Mini-clinical evaluation exercise (Mini-CEX)

The Nursing-Mini-CEX scale, utilized to evaluate clinical nursing capabilities [24], covers nursing history taking, nursing examination, nursing diagnosis, nursing measures, health consultation, humanistic care, organizational effectiveness, and overall evaluation. This tool is validated for its reliability and effectiveness in assessing practical nursing skills [25]. Each item is rated on a 9-point scale, with 1–3 points indicating performance below requirements, 4–6 points indicating meeting requirements, and 7–9 points indicating excellence. The excellence rate is calculated using the formula: Excellence Rate = (Number of Excellent + Good + Passing Scores)/ Total Number of Individuals × 100%.

Humanistic care ability

The assessment of humanistic care ability is conducted using the Caring Ability Inventory (CAI) scale [26]. This assessment tool is segmented into three dimensions, encompassing a total of 37 items. The scale's Cronbach's Alpha coefficient ranges from 0.67 to 0.80, indicating acceptable reliability. Higher scores denote more potent caring abilities.

Patient satisfaction survey

At the time of discharge, a nursing satisfaction survey is used to conduct a questionnaire survey on patient satisfaction, assessing their satisfaction level with the new nurses [27]. The satisfaction survey covers all possible feelings patients might have about nursing service satisfaction, from very satisfied to dissatisfied.

Statistical processing

The data were analyzed using SPSS 26.0 statistical software. Numerical variables that followed a normal distribution were presented as mean±standard deviation, while those that did not were expressed as median values (min-max). Categorical variables were reported as numbers and percentages (%). An independent samples *t*-test was employed to compare groups of numerical variables with a normal distribution. Welch's *t*-test was used to compare groups of numerical variables without a normal distribution. Comparisons between groups of categorical variables were conducted using Chi-square or Fisher exact chi-square tests, with statistical significance set at P < 0.05.

Results

Comparison of theoretical knowledge examination and skills assessment

Upon evaluating the theoretical knowledge and operational skills of the two groups of new nurses, the observation group obtained a theoretical examination score of (95.987 ± 2.129) points, a practical examination score of (96.987 ± 1.254) points, and a comprehensive score of (96.487 ± 1.234). The control group's theoretical examination score amounted to (94.756 ± 2.773) points, the practical examination score was (95.902 ± 1.855) points, and the comprehensive score was (95.329 ± 1.841). The scores of the observation group for the theoretical knowledge examination (Fig. 1a) (P=0.029), practical examination (Fig. 1b) (P=0.003), and comprehensive scores (Fig. 1c) (P=0.002) were all superior to those of the control group (P<0.05), These results indicate that the competency-focused training significantly enhanced both theoretical and practical skills, aligning with our research objective to improve overall nurse preparedness. as detailed in Fig. 1.

Comparison of job competency between the two groups of new nurses

Upon assessing the job competency of the two groups of new nurses, the observation group attained 10 points in professional quality, with general work capability at (34.718±0.916), communication and coordination ability at (13.949 ± 0.605) , proactive management at (13.974 ± 0.778) , patient safety at (14.128 ± 0.767) , health education at (8.564 ± 0.552) , and an overall competency of (95.333 ± 1.420) . The control group achieved 10 points in professional quality, with general work capability at (34.268 ± 0.708) , communication and coordination ability at (13.634±0.733), proactive management ability at (13.634 ± 0.733) , patient safety ability at (13.780 ± 0.725) , health education ability at (8.293 ± 0.559) , and overall competency of (93.61 ± 1.481) . The scores of the observation group in general work capability(Fig. 2a) (P = 0.016), communication and coordination ability (Fig. 2b) (P=0.039), proactive management ability (Fig. 2c) (P=0.047), patient safety management ability (Fig. 2d) (P=0.040), health education (Fig. 2e) (P=0.032), and Overall competency (Fig. 2f) (P=0.000) were all superior to those of the control group. These findings support the hypothesis that the job competency-centered model effectively enhances critical nursing skills, with statistically significant differences [P < 0.05], as detailed in Fig. 2.

Nursing-Mini-CEX scores

Upon evaluating the Nursing-Mini-CEX scores of the t two groups of new nurses, it was observed that in the observation group, 29/39 (74.36%) achieved an Excellent rating, 10/39 (25.64%) were rated as Good; thus, attaining a remarkable excellence rate of (39/39) 100%. Conversely, in the control group, there were 14/41 (34.15%) obtained an Excellent score, and another set of 15 /41 (36.58%) were rated as Good. In comparison, a total of 9/41 (21.95%) managed to Pass, and merely three individuals failed to meet expectations, with a Failing grade accounting for approximately 7.32%. The excellence rate achieved





Fig. 1 Comparison between the two groups of theoretical knowledge exams (**A**), practical tests (**B**), and comprehensive tests (**C**) in the observation group and the control group. Data are presented as mean ± SD (standard deviation). Independent samples t-test is used to identify which group differences are significant

by this group was 87.80%. Notably, the Nursing-Mini-CEX assessment scores in the observation group significantly surpassed those recorded in the control group (P=0.0003), This demonstrates that competency-based training significantly improved clinical performance, a key research objective, as illustrated in Fig. 3.

Humanistic care assessment

In evaluating the humanistic care abilities of the two groups of new nurses, the observation group obtained scores of (66.410 ± 3.362) in the cognitive dimension, (65.923 ± 3.115) in the courage dimension, (60.308 ± 3.686) in the patience dimension, yielding a total score of (192.641 ± 5.451) in the overall humanistic care ability. The control group attained scores of 64.488 ± 3.543 in the cognitive dimension, (64.317 ± 3.446) in the courage dimension, (57.902 ± 5.004) in the patience dimension, resulting in a total score of (186.707 ± 8.143) in the overall humanistic care ability. The control group in cognitive dimension (Fig. 4a) (*P*=0.015), courage dimension (Fig. 4b) (*P*=0.032), patience dimension

(Fig. 4c) (P=0.017), and overall humanistic care ability (Fig. 4D) (P=0.000) were all superior to those of the control group, indicating statistically significant differences (P<0.05). These results confirm that the new training model enhances humanistic care abilities, fulfilling another key objective of the study, as detailed in Fig. 4.

Patient satisfaction assessment

After assessing the patient satisfaction scores of the new nurses in both groups, it was found that 22 out of 39 (56.41%) in the observation group received a score of "Very satisfied," and 16 out of 39 (41.03%) received a score of "Satisfied." Only 1 out of 39 (2.56%) was rated as "General," thus giving an overall satisfaction rate of 100% in this group. In comparison, 15 out of 41 (36.59%) of the control group received a score of "Very satisfied," and 15 out of 41 (36.59%) were rated "Satisfied." In addition, 9 (21.95%) of the 41 participants received a "general" rating, and 2(4.87%) received a "Dissatisfied" rating. The excellence rate for this control group was calculated to be about 87.80%. The patient satisfaction rate in the



Fig. 2 Evaluation of job competencies between the two groups. The figure shows, except for the general work capability (**A**), the scores of the observation group in communication and coordination ability (**B**), proactive management ability (**C**), patient safety management ability (**D**), health education (**E**) and overall competency (**F**) were all superior to those of the control group

observation group exceeded that of the control group (P=0.0263), showing statistically significant differences (P<0.05), This aligns with our goal of improving patient care quality through enhanced training methods, as detailed in Fig. 5

Discussion

This study conducted a comprehensive competency assessment for newly hired nurses. The results indicated that there was no significant difference in professional quality between the observation and control groups. However, the observation group significantly surpassed the control group in general medical abilities, communication and coordination skills, proactive management, patient safety, and health education. These findings



Fig. 3 Comparison of Nursing-Mini-CEX excellence rates between the observation group and the control group. The observation group achieved significantly higher scores than the control group. Excellence Rate = (Number of Excellent + Good + Passing Scores) / Total Number of Individuals × 100%

highlight the effectiveness of competency-based standardized training in enhancing the practical working capabilities of new nurses. This training enables them to effectively address real-world challenges, establish



Fig. 5 Comparison of patient satisfaction scores between the observation group and the control group. The results indicate that the observation group reported significantly higher satisfaction scores, including "very satisfied", "satisfied", and "satisfaction rate", compared to the control group. Satisfaction rate = (Very Satisfied + Satisfied + General) / Total Number of People × 100%



Fig. 4 Evaluation of humanistic care abilities in the observation group compared to the control group across various dimensions. The observation group exhibited significantly higher cognitive scores (4A), courage scores (4B), and patience scores (4C) in the observation group. Overall humanistic care ability scores (4D) showed a highly significant improvement in the observation group compared to the control group

efficient communication with patients and colleagues, and proactively streamline work processes to enhance efficiency. Moreover, this competency-based training system not only enhanced the individual abilities of new nurses but also elevated the overall quality of nursing services. This discovery is consistent with previous research, further affirming the significance of professional training and education in enhancing the professional skills and knowledge level of nursing staff [28], thereby fostering work efficiency and patient satisfaction. The program's strengths lie in its ability to integrate theoretical knowledge with practical skills, providing a balanced approach that is crucial for modern healthcare settings. This underscores the pivotal role of standardized training in the development of the nursing profession and provides insights for future nursing education and practice.

The study results indicate that newly hired nurses in the observation group exhibited exceptional performance in both theoretical knowledge and skills assessment. Specifically, they outscored the control group in both theoretical and practical skills evaluations, underscoring the necessity for a balanced development in theoretical knowledge and practical skills. The systematic educational methods and abundant practical opportunities provided by the program are key strengths that contributed to these high scores [29]. In the Nursing-Mini-CEX evaluation, nurses in the observation group attained a 100% rate of excellence, compared to an 87.80% rate of excellence in the control group. This significant difference reveals the superiority of the observation group's clinical skills and decision-making abilities, suggesting that the intervention's clinical teaching strategies are more effective. By implementing diverse teaching methods such as Mini-CEX, scenario simulations, roleplaying, and standardized patients, we not only stimulated the learning enthusiasm of new nurses but also enhanced their abilities to think independently, analyze problems, and solve problems. Consequently, they were more effectively able to master professional theoretical knowledge and practical skills [30, 31]. Moreover, the high scores on the Nursing-Mini-CEX assessment scale also signify the exceptional performance of nurses in the observation group in clinical skills, communication abilities, and patient management, which is highly significant for enhancing the quality of patient care, improving professional competency, and fostering teamwork. This study demonstrates that competency-based standardized training significantly enhances the humanistic care qualities of newly hired nurses and overall patient satisfaction. This improvement is attributed to the specialized training the nurses received, enhancing their insight and responsiveness to patients' emotional and psychological needs. The training emphasized empathy, patience, and communication skills, aiming to cultivate nurses' ability to provide high-quality care in the dynamic medical environment [32, 33]. Therefore, the competency-based induction training model for new nurses proves to be a practical and effective method. It improves not only the professional skills and comprehensive practical abilities of new nurses but also accelerates their adaptation to new work environments and roles. Through this training, the work efficiency and quality of nursing services of new nurses have been effectively enhanced, thereby enhancing patients' trust and satisfaction and meeting high standards of clinical care.

In the nursing sector, delivering standardized training for new employees is both a complex and vital task. This process necessitates continuous supervision and enhancement, with regular evaluations and feedback mechanisms in place to ensure that the knowledge and skills of new nurses meet high standards. These measures ensure that the nursing team can provide exceptional care to patients, highlighting the program's strength in adaptability and continuous improvement. This research aims to provide references for the field of nursing education and practice, laying a solid foundation for future studies.

However, the study's focus on a single hospital may introduce biases that limit external validity. The local culture and training standards could skew results towards higher-performing nurses, affecting competency training assessment. Therefore, future research should pursue multi-hospital collaborations to enhance external validity. Although convenience sampling ensured a representative sample of new nurses, it may limit the applicability of findings to other settings. Additionally, the sample size was determined based on practical considerations and previous literature, which may have impacted the statistical power of the study. Future research should calculate sample sizes using formal statistical methods to ensure more robust and reliable results.

Conclusion

The implementation of a competency-based training system is vital to enhancing the professional skills and service quality of newly hired nurses. This training model places emphasis not only on the acquisition of theoretical knowledge but also on the development of practical skills and humanistic care abilities, ensuring that new nurses can swiftly adapt to the demands of clinical work. Healthcare institutions are recommended to widely apply this model in the induction training of new nurses, establishing feedback mechanisms to regularly gather nurses' views on the training content and methods, as well as their professional development and satisfaction. Through this feedback, training programs and resources can be continuously assessed and optimized, effectively improving the overall professional level and work capacity of the new nursing team.

Supplementary Information

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Supplementary Material 1

Author contributions

FL: Writing—original draft, Methodology, Validation, Formal analysis, Investigation, Resources, Data curation, Supervision, Writing—review & editing the manuscript. H M, X W and YX: Validation, Investigation, Resources, Data curation, Project administration. J C: Writing—review & editing, Validation, Investigation, Resources, Data curation, Project administration. All authors reviewed the manuscript and approved the submitted version.

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Data availability

The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

This study was conducted in full compliance with the ethical principles of the Declaration of Helsinki. The Ethics Committee of the Second Affiliated Hospital of Chongqing Medical University approved this study (Approval Number: V1.0/2024.05.01). All patients recruited in this study provided written informed consent, agreeing to the use of their clinical data for non-commercial scientific research. All participants were informed of their right to withdraw from the study at any time without any negative consequences.

Consent for publication

Not applicable.

Patient and public involvement

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

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Competing interests

The authors declare no competing interests.

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