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Construction and Implementation Effect Evaluation of a Hierarchical Training Model for Nurses

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Abstract: *Objective:* To construct a scientific and effective hierarchical training model for nurses and systematically evaluate its implementation effect, so as to improve nurses' professional competence, job satisfaction, and quality of nursing services. *Methods:* Through literature analysis, Delphi expert consultation, and current situation investigation, a training system targeting nurses at different levels was designed. A quasi-experimental study was conducted, selecting nurses from a Grade A tertiary hospital as research objects, divided into an experimental group (implementing hierarchical training) and a control group (receiving conventional training), with a training cycle of 6 months. Data were collected through multiple dimensions, including questionnaires, theoretical assessments, skill operation evaluations, and nursing quality assessments, and statistical analysis was performed using SPSS 26.0. *Results:* After the implementation of hierarchical training, the total score of core competencies and scores in all dimensions (such as clinical nursing, professional development, and leadership) of nurses in the experimental group were significantly improved ($P < 0.05$); all indicators of job satisfaction were significantly higher than those in the control group ($P < 0.01$); nursing quality scores and patient satisfaction were also significantly improved ($P < 0.05$). The improvement effect of hierarchical training varied among nurses at different levels. *Conclusion:* The hierarchical training model for nurses can improve the professional literacy and professional identity of nurses at all levels, optimize the quality of nursing services, and is a feasible and effective nursing human resource training strategy. It is recommended to further combine nurses' career development paths to build a long-term and systematic hierarchical training system.

Keywords: Nurse training; Hierarchical management; Core competencies; Job satisfaction; Nursing quality; Effect evaluation

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1. Introduction

With the continuous progress of the medical system and the increasing health needs of patients, nursing work plays an increasingly critical role in medical services. As core members of the medical team, nurses' professional competence, professional literacy, and service level directly affect patient outcomes and medical quality. However, the nursing team in China generally faces problems such as a single training model, disconnection between content and practice, and an imperfect evaluation system. The traditional "one-size-fits-all" training model can no longer meet the growth needs of nurses at different development stages [1]. Therefore, constructing a scientific, systematic, and targeted hierarchical training system for nurses has become an important issue in current nursing human resource management.

Hierarchical training for nurses designs differentiated training content and methods based on factors such as nurses' professional competence, clinical experience, and job levels, aiming to optimize the allocation of training resources and achieve a phased improvement of nurses' abilities. Foreign countries have formed relatively mature systems in hierarchical training for nurses, such as the Clinical Ladder proposed by the American Nurses Association (ANA), which emphasizes the combination of training with career development and performance appraisal [2]. Relevant domestic studies have gradually increased, but most focus on training practices for a specific level or single department, lacking hospital-wide and systematic model construction and effect verification [3–4].

To this end, based on the competency model and adult learning theory, combined with the actual situation of nursing management in Chinese hospitals, this study constructed a four-in-one training system covering training objectives, content, methods, evaluation, and feedback, and evaluated its application effect through a quasi-experimental study, aiming to provide empirical evidence and reference paths for nursing education and training as well as talent team building.

2. Theoretical construction of the hierarchical training model for nurses

2.1. Theoretical basis

The design of the hierarchical training model for nurses draws on the Competency Model and Andragogy. The Competency Model emphasizes that personnel in different positions and levels should have differentiated combinations of knowledge, skills, and qualities, providing a basis for the formulation of hierarchical standards in this study [5]. Andragogy points out that adult learning is characterized by self-direction, experience-based learning, and problem-centered learning, suggesting that training should focus on participation, practicality, and utility [6].

2.2. Hierarchical standards for nurses

Through literature analysis, two rounds of Delphi expert consultation (n=15), and investigation by the hospital nursing department, nurses were ultimately divided into the following five levels:

N0 (Newly recruited nurses): Working experience < 1 year, in the stage of job adaptation and basic skill learning;

N1 (Junior nurses): Working experience 1–3 years, capable of independently completing routine nursing operations;

N2 (Intermediate nurses): Working experience 4–6 years, with certain specialized nursing capabilities and

teaching awareness;

N3 (Senior nurses): Working experience 7–10 years, undertaking specialized nursing, quality control, or teaching responsibilities;

N4 (Nursing experts): Working experience ＞ 10 years, with senior professional titles or specialized nurse qualifications, carrying out nursing scientific research or management innovation.

2.3. Training system design

A four-in-one training system of "objectives-content-methods-evaluation" was constructed according to the characteristics and development needs of each level:

2.3.1. Training objectives

N0 focuses on job integration and safety norms, N1 on independent practice capabilities, N2 on specialized nursing and teaching, N3 on quality management and clinical teaching, and N4 on scientific research innovation and discipline leadership.

2.3.2. Training content

Covers five modules, including basic theory and knowledge update, nursing operation skills, communication and collaboration capabilities, nursing management and teaching capabilities, and scientific research methods and innovative practice. The depth and breadth of content increase progressively at each level.

2.3.3. Training methods

Adopt diversified strategies, including centralized teaching, workshops, case discussions, scenario simulations, bedside teaching, mentoring systems, and online learning, emphasizing "learning by doing" and reflective practice.

2.3.4. Evaluation system

Form a multi-dimensional evaluation mechanism combining "process evaluation + result evaluation", "self-evaluation + peer evaluation", and "quantitative evaluation + qualitative evaluation", including theoretical assessments, skill OSCE assessments, 360-degree behavioral evaluations, and monitoring of nursing quality indicators.

3. Research design and methods

3.1. Research type

A quasi-experimental study design was adopted, with an experimental group and a control group.

3.2. Research objects

The overall research population included registered nurses working in a Grade A tertiary general hospital from January 2022 to June 2023. Inclusion criteria: (1) Holding a nurse practicing certificate; (2) Voluntarily participating in the study; (3) Currently engaged in clinical nursing work. Exclusion criteria: (1) Advanced training or student nurses; (2) Those who resigned or took long-term leave during the study period.

Using convenience sampling, a total of 320 nurses were included, and randomly divided into an experimental group (n=160) and a control group (n=160) after stratified sampling by department. There were no statistically significant differences in general data such as age, educational background, professional title, and working experience between the two groups of nurses ($P > 0.05$), indicating good comparability.

3.3. Intervention measures

Experimental group: Implement a 6-month hierarchical training, including 1 centralized training per month, weekly departmental practical training, and regular case discussions and assessments.

Control group: Maintain the hospital's conventional annual training plan without hierarchical design.

3.4. Evaluation tools and indicators

3.4.1. General data questionnaire

Including demographic and occupational characteristic information.

3.4.2. Nurse core competence scale (NCS)

Adopt the Chinese version revised by Liu et al. (2020), including 7 dimensions such as clinical nursing, professional development, and legal and ethical practice, with a total of 58 items, Cronbach's α=0.94.

3.4.3. Nurse job satisfaction scale (NJS)

Refer to the scale compiled by Mueller & McCloskey (1990), including 8 dimensions such as work itself, salary and benefits, management support, and interpersonal relationships, with a total of 44 items, Cronbach's α=0.89.

3.4.4. Nursing quality evaluation form

Adopt the quality control score sheet formulated by the hospital nursing department, covering basic nursing, specialized nursing, medical record writing, patient safety, health education, etc., with a full score of 100 points.

3.4.5. Patient satisfaction questionnaire

Adopt the unified inpatient satisfaction questionnaire used by the hospital.

3.5. Data collection and statistical analysis

Data were collected before training and within 1 week after the end of training. SPSS 26.0 was used for data analysis. Measurement data were expressed as (Mean ± SD), an independent sample t-test was used for inter-group comparison, and a paired t-test was used for intra-group pre- and post-comparison; count data were expressed as frequency and percentage, and x^2 test was used; $P < 0.05$ was considered statistically significant.

4. Results

4.1. Comparison of nurses' core competencies

After training, the total score of core competencies and scores in all dimensions of nurses in the experimental group were significantly higher than those before training ($P < 0.05$), and also significantly higher than those in the control group ($P < 0.01$), as shown in **Table 1**.

Table 1. Comparison of core competence scores of nurses in the two groups (Mean ± SD, points)

Group	Number of Cases	Time Point	Clinical Nursing	Professional Development	Leadership	Total Core Competence Score
Experimental Group	160	Before Training	35.2 ± 4.8	22.1 ± 3.5	18.9 ± 3.1	152.3 ± 15.6
		After Training	42.3 ± 5.6	28.5 ± 4.2	24.1 ± 3.9	186.7 ± 18.4
		t-value (Intra-group)	12.354	14.217	11.896	18.332
		P-value (Intra-roup)	< 0.001	< 0.001	< 0.001	< 0.001
Control Group	160	Before Training	34.9 ± 5.1	21.8 ± 3.7	19.2 ± 3.0	151.8 ± 16.2
		After Training	38.1 ± 4.9	25.3 ± 3.8	21.0 ± 3.5	168.2 ± 16.7
		t-value (Intra-group)	5.678	7.912	4.345	9.451
		P-value (Intra-group)	< 0.001	< 0.001	< 0.001	< 0.001
Inter-group Comparison (After Training)	-	t-value	6.872	6.512	7.124	9.243
		P-value	< 0.001	< 0.001	< 0.001	< 0.001

4.2. Comparison of job satisfaction

After training, the scores of all dimensions and total score of job satisfaction in the experimental group were significantly improved ($P < 0.01$), and significantly higher than those in the control group ($P < 0.01$), especially in aspects such as “work autonomy”, “professional growth opportunities”, and “management support.”

4.3. Comparison of nursing quality and patient satisfaction

After training, the nursing quality score of the wards where the experimental group was located increased from 85.6±6.2 points to 92.4±5.1 points ($P < 0.05$), and patient satisfaction increased from 88.7% to 95.2% ($P < 0.05$); although the two indicators in the control group slightly increased, the differences were not statistically significant ($P > 0.05$).

4.4. Differences in effects among nurses at different levels

Further subgroup analysis showed that hierarchical training had the most significant improvement on the basic skills and confidence of N0 and N1 nurses; it significantly promoted the specialized competence and teaching management capabilities of N2 and N3 nurses; and inspired N4 nurses in terms of research design and disciplinary influence.

5. Discussion

5.1. The role of hierarchical training in improving nurses' core competencies

The results of this study show that hierarchical training can targeted strengthen the professional competence of nurses at all levels, especially the leadership and teaching capabilities of middle and senior nurses, which is consistent with the research conclusions of Al-Dossary et al. [7–9]. The mechanism lies in the matching of training content with nurses' development stages, which stimulates learning motivation and professional responsibility [10–12].

5.2. The positive impact of hierarchical training on job satisfaction

By providing personalized growth paths, enhancing professional identity, and improving management support, training significantly improves nurses' job satisfaction, which helps reduce nurses' turnover intention and stabilize the nursing team [13–14].

5.3. The promotion of hierarchical training on the quality of nursing services

The improvement of nurses' abilities is directly transformed into the optimization of clinical nursing behaviors, thereby improving nursing quality and patient experience. The results of this study support the effectiveness of the "training-competence-quality" transmission path [15].

5.4. Innovations and limitations of this study

The innovation lies in constructing a unified and clearly hierarchical training system for the entire hospital and conducting multi-dimensional effect verification. Limitations include: the sample was from a single hospital, so the generalization of conclusions needs to be cautious; the follow-up time was short, and long-term effects need to be observed; the influencing factors of training effects were not deeply explored.

6. Conclusion

This study constructed and implemented a hierarchical training model for nurses, confirming that it has significant effects in improving nurses' core competencies, job satisfaction, and nursing quality. This model reflects the educational concept of "teaching students in accordance with their aptitude and progressing step by step", and has strong clinical applicability and promotion value.

Disclosure statement

The author declares no conflict of interest.

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