Construction of Nursing HRM Model Based on Manpower Supermarket Resource Bank

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Abstract

Objective: To investigate the effects of implementing a “manpower supermarket” resource bank management model in nursing human resource management at Jiangsu Province Academy of Traditional Chinese Medicine.

Methods: The supermarket management concept was first developed and applied to manpower service administration. Subsequently, a framework for nursing human resource management was established. This involved developing a “commodity” bank for the “manpower supermarket”, consisting of (1) a general nurse bank, (2) a special post mobile bank, and (3) a post competency enhancement bank. The quality of “commodities” was ensured through integration of job training and recruitment unit criteria. Concurrently, a standardized selection pathway was established, encompassing standardization of the order-sending review process, implementation of “commodity” maintenance regulations, and screening of selection unit conditions, thereby ensuring streamlined operation of the “manpower supermarket”.

Results: From October 2021 to October 2022, a total of 1,284 nurses were dynamically deployed across the hospital in 31 separate batches. In addition to enhancing the quality of nursing human resource management and specialized nursing care quality, the high-frequency staff deployment coupled with orderly and innovative management reduced both patient complaint rates and nurse turnover rates.

Conclusion: The manpower supermarket management model, which integrates diversified staffing needs, the requirement for flexible nursing staff management in routine epidemic prevention and control, as well as nursing staff capacity development, merits adoption to address the current demands of nursing human resource management in medical services.

Full Text

Construction of a Nursing HRM Model Based on a "Manpower Supermarket" Resource Bank

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Abstract

Objective: To explore the effect of implementing "manpower supermarket" resource bank management in nursing human resource management at the Jiangsu Province Academy of Traditional Chinese Medicine.

Methods: The concept of supermarket management was first developed and applied to the administration of manpower services. Next, the structure of nursing human resource management was established by developing the "commodity" bank of the "manpower supermarket," comprising (1) a general nurse bank, (2) a special post mobile bank, and (3) a post ability refueling bank. The quality of "goods" was ensured by combining job training with recruitment unit

criteria. In parallel, a standardized selection path was created, including the standardization of the order-sending review process, implementation of "commodity" maintenance regulations, and screening of selection unit conditions, thereby ensuring streamlined operation of the "manpower supermarket."

Results: From October 2021 to October 2022, a total of 1,284 nurses were dynamically deployed across 31 different batches. In addition to boosting the quality of nursing human resource management and specialized nursing care, the high frequency of staff deployment and orderly, innovative management decreased both patient complaint rates and nurse turnover rates.

Conclusion: The manpower supermarket management model, which combines diversified staffing needs, flexible nursing staff management for routine epidemic prevention and control, and nursing staff capacity development, is worth learning from as it meets the requirements of nursing human resource management in the current medical service environment.

Keywords: Manpower supermarket; Jiangsu Province Academy of Traditional Chinese medicine; Nursing human resource management; Model construction

The Corona Virus Disease 2019 (COVID-19) was classified as a worldwide pandemic by the World Health Organization in March 2020 [1]. While China has successfully prevented and controlled its outbreak, the global situation remains critical, and China continues to face risks of "importation and rebound" from overseas [2]. Public hospitals frequently remain in a state of "alert" for managing nursing human resources due to increased demand for medical services, heightened medical responsibilities, and intensive work to prevent epidemics. According to studies, 270 research articles have been published since 2020 on nursing human resources [3]; however, few studies have examined nursing HRM in public hospitals under the current environment. "Manpower supermarket" describes human resources services operated like a supermarket, enabling companies to easily select desired HR services as if shopping. This model was initially implemented in Anhui Province [4].

1. Methods

1.1 General Data

The study participants were 437 nursing staff members from a large, comprehensive, integrated tertiary public hospital in Jiangsu Province. The hospital has developed a multi-level nursing talent structure and has used tiered training management of N1–N4 levels for in-service nurses for many years. Since the COVID-19 pandemic outbreak, the hospital has completed nearly 20 out-of-hospital anti-epidemic support missions over the past two years, ranging from isolation and treatment of suspected and confirmed patients, to district-wide COVID-19 vaccination, to supporting provincial and municipal mobile cabin hospital teams, as well as nucleic acid sampling teams. To relieve demand for

nursing resources, the "manpower supermarket" management system was established in 2022, accumulating valuable experience that is presented below.

1.2 Implementation Framework

1.2.1 Management Group Structure Under the theory of hierarchical management, the hospital created a three-level management structure consisting of a resolution layer, a presiding layer, and a practice layer. The presiding layer comprises the director and deputy director of the nursing department, who make specific coordination arrangements based on the actual nursing workload in the hospital. The resolution layer consists of hospital leaders in charge, who primarily conduct overall planning in conjunction with requirements from national, provincial, and municipal health committees and the hospital. The practice layer comprises the nursing HRM project team, department nurse leaders, and ward nurse leaders, whose key responsibilities include formulating project standards, staff training, data tracking, and process optimization.

1.2.2 Operation Planning 1.2.2.1 Confirmation of Operation Characteristics: The characteristics of supermarkets—small profits, small packaging of goods, customer choice, and single settlement payment upon exit—were transformed into the following principles for manpower supermarket operation [6]: low seniority and low title personnel as the basis for "thin profit"; single personnel, single nursing projects, and single special nursing skills as the focus; wards with needs applying independently as the operational chain; and personnel work performance paid by monthly units.

1.2.2.2 Screening of the "Commodity" Bank: Based on previous manpower management experience, the nursing department selects criteria and reserves the nursing manpower resource deployment bank—known as the "commodity" bank—in batches according to ward demands. The "commodity" bank includes: (1) **General Practice Nurse Bank** with selection criteria including: (a) nursing staff actively involved in clinical nursing work (both front-line and non-front-line departments); (b) nursing staff at N1-N3 ability levels; (c) parental (or spouse) support; (d) absence of pertinent family issues; and (e) voluntary enrollment and active cooperation. Exclusion criteria include: (a) nursing employees on internship, advanced training, sick leave, or sabbaticals, those doing non-clinical nursing work, nurse leaders, and N4 nurses; and (b) emotionally unstable people or those with family obligations.

(2) **Special Positions Motorized Bank** includes: (a) **Internet Nursing Bank** requiring provincial specialized nurse title and Nanjing Nursing Association Internet+ nursing pre-service training certification; (b) **Medical Examination Center Phlebotomy Nursing Motorized Bank**; and (c) **Research Ward Nursing Bank** based on the General Practice Nurse Bank, prioritizing those with research expertise, specialized nurses, and hospital nursing staff.

(3) **Position Ability Refueling Bank** includes: (a) **Emergency Infusion Emergency Bank** composed of newly recruited nursing staff undergoing three-year standardized training, required to participate in their spare time and cooperate with the "100 Needle Puncture Program" as volunteers, with discharge criteria being $ $100 venipunctures; and (b) **Acute Care Promotion Bank** for nursing staff with N2 level qualification intending to declare N3 level within one year.

1.2.2.3 Cultivation of General Nursing Competence to Ensure "Commodity" Quality: First, a structural plan for developing general nursing competence was established, with training content and techniques based on the principle of unified allocation from the hospital's bed allocation center for specialty admissions (Table 1). Second, the nurse leader who is a member of the nursing human resource team leads the training team, with the nurse leader of the appropriate specialty as a member, collaborating to construct the lesson plan for general nursing competence training (the "teaching plan"). The teaching plan comprises 80 hours of instruction over a two-week period, consisting of four components: relevant knowledge, professional knowledge, professional skills, and practical evaluation. Third, centralized lectures and CDIO modes are employed for instruction and assessment, while written tests and situational evaluations are used for evaluation [5-7], with findings based on each person's annual performance.

1.2.3 Purchase Process

1.2.3.1 Conditions for Purchasing Units: (1) Bed utilization rate $ $95% in the past 2 weeks; (2) 20-30% year-on-year increase in number of critical patients; (3) Scheduled sections requiring drafting for sudden public events, etc.

1.2.3.2 Order Sending and Review Process: The unit nurse leader sends the staff demand order → the nursing department's human resource team reviews and confirms whether conditions are met → screens nursing units with bed utilization rate $ $80% in the past 1-2 weeks and ranks weekly bed utilization rate from lowest to highest → locks qualified staff according to specific nursing characteristics of the demand ward → the nursing department's designated person notifies staff to complete the order.

1.2.3.3 Provisions on "Commodity" Maintenance: (1) During the period of performing nursing work ordered by the "supermarket," nursing staff performance and assessment receive the same treatment as same-level staff in the unit; (2) Special position working hours are set following position requirements, with daily working time between 4-8 hours in principle, and performance issued by overtime hours; (3) Online-hiring nursing workers use personal spare time, with 70% of the service fee issued to the individual.

1.3 Evaluation Metrics

1.3.1 Nursing Human Resource Deployment Statistics were collected on the batches and numbers of nursing human resource deployment in the hospital from October 2021 to October 2022.

1.3.2 Time Consumption and Success Rate of One-Time Redeployment The time spent on redeployment and the number of staff successfully redeployed at one time were counted for two periods: October 2020 to October 2021 and October 2021 to October 2022. Success rate of one-time redeployment = (number of successful deployments / total number of deployments) × 100%.

1.3.3 Quality of Nursing Human Resource Management The nursing department created a supervision and assessment form for nursing human resource management quality control, including five items: man-post matching, stratification, hierarchical matching, dynamic deployment, and reasonable scheduling, each scored out of 100 points. Monthly, the head and secretary of the nursing department's quality management team randomly inspected 26 clinical nursing units for scoring and assessment, then compared average performance before and after "manpower supermarket" implementation.

1.3.4 Qualified Rate of Specialized Nursing Quality The nursing department's nursing quality supervision questionnaire was adopted, covering nurses' mastery of patient conditions, health education efficiency, and patient satisfaction with nursing work. Questionnaires were randomly distributed to patients before and 3 months after "manpower supermarket" management implementation, distributed and collected on-site on the day of discharge. Of 100 questionnaires distributed, 98 valid responses were collected (98% effective recovery rate).

1.3.5 Patient Complaint Rate and Nurse Turnover Rate Numbers of patient complaints and nurse turnover cases were counted through the hospital management and attendance system for each year before and after implementation. Patient complaint rate = (number of complaints / total number of patients) × 100%. Nurse turnover rate = (number of staff turnover / total number of nurses) × 100%.

1.3.6 Statistical Analysis SPSS 13.0 statistical software was applied. Count data were described by number and percentage, with ^{2} test for between-group comparisons. Measurement data were described by mean ± standard deviation, with t-test for statistical analysis between groups.

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2. Results

2.1 Nursing Human Resource Deployment

Based on the sickbed-to-nurse ratio and sickbed utilization rate in each ward, 400 nursing staff members were selected to join the nursing human resource deployment bank between October 2021 and October 2022. A total of 31 batches comprising 1,284 nurses were dynamically deployed (Table 2 and Figure 1 [Figure 1: see original paper]), including 20 instances of various epidemic prevention and control support missions with zero medical staff infection rate.

[Figure 1: see original paper]

2.2 Success Rate and Deployment Time Consumption

After implementing the "manpower supermarket" resource bank, the success rate of nurse deployment was 97.18%, significantly higher than the 80.54% before implementation ($P < 0.05$). Deployment time consumption after implementation was $(2.57\$\pm1.05)hours, significantlylowerthanthe(8.77\pm\$2.33)$ hours before implementation ($P < 0.05$) (Table 3 and Figure 2 [Figure 2: see original paper]).

[Figure 2: see original paper]

2.3 Quality Improvement of Nursing HRM

After implementation, quality scores for all five key management components improved significantly (Table 4 and Figure 3 [Figure 3: see original paper]): man-post matching increased from $86.52\$\pm2.13to95.35\pm1.47$, $stratificationfrom82.17\pm1.12to88.85\pm1.63$, $hierarch$ (all $P < 0.001$).

[Figure 3: see original paper]

2.4 Improvement in Specialized Nursing Care Quality

Following "manpower supermarket" management implementation, nurses' mastery of patient conditions improved from 67 (83.75%) to 79 (98.75%), health education efficiency from 61 (76.25%) to 75 (93.75%), and patient satisfaction with nursing care from 73 (91.25%) to 79 (98.75%) (Table 5 and Figure 4 [Figure 4: see original paper], all $P < 0.05$).

[Figure 4: see original paper]

2.5 Patient Complaint Rate and Nurse Turnover Rate

After implementing the "manpower supermarket" resource bank, the patient complaint rate was 1.62%, significantly lower than the 7.05% before implementation ($P < 0.05$). The nurse turnover rate was 2.75%, significantly lower than the 10.54% before implementation ($P < 0.05$) (Table 6 and Figure 5 [Figure 5: see original paper]).

[Figure 5: see original paper]

3. Discussion

3.1 Supermarket Operation of Manpower Management Facilitates Efficient Deployment of Nursing Human Resources

To ensure rapid and efficient execution of rescue and treatment, building a nursing emergency management system for public health emergencies and improving nursing team coordination are crucial [6-7]. Since April 29, 2020, national epidemic prevention and control has reached a normalized state [8], with medical institutions nationwide actively exploring efficient human resource resilience utilization programs. Although the overall domestic epidemic is sporadically disseminated with sudden rebound possible at any time, the supermarket operation concept—where sellers operate goods while paying attention to quality and encouraging purchases through continuous improvement—can be applied to human resources management. By addressing employing units' demands, this approach not only enables ongoing personnel capability enhancement but also fosters staff development through practical training, thereby reducing nursing personnel needs in the current medical care environment and shortening staff maturation time.

Our data revealed that after implementation, 92% of the 400 nursing staff were swiftly selected for the human resource bank, with 31 batches dynamically deployed totaling 1,284 nurses (three times the bank's capacity), meaning each bank nurse experienced at least three job deployments annually.

3.2 Manpower Supermarket Operation Improves Nursing HRM Quality

This study demonstrated that following implementation, the quality of five key management components—job matching, job stratification, hierarchy, dynamic deployment, and logical scheduling—significantly improved [9]. The model presents a cutting-edge management technique adhering to "people-centered" principles. Through specific post and responsibility development, nursing staff completed duties as expected in daily care, with more reasonable distribution of nursing service resources. Additionally, comprehensive evaluation of staff functions regarding professional competence enabled each nurse to demonstrate value in their work. The model combines three supermarket operation guarantees—(1) high-quality goods, (2) consumers with demand, and (3) reasonable operation management—following three principles: (1) nursing staff matching ability levels, (2) hiring units with demand, and (3) standardized nursing performance management.

Through homogenized general nursing training, the nursing department generated basic-level (N1-N2) nursing employees for deployment. Seasonal recruiting

needs of certain medical units were also satisfied, such as emergency infusion banks in spring and fall and trauma center emergency personnel demands in winter and spring. After entry-level staff completed three years of standardized training and participated in emergency hiring unit exercises reaching advanced skill development, they met demands for immediate disease-fighting assistance and online nursing communities. As work training progressed, nursing staff's demand for professional self-improvement increased, making the acute and critical care enhancement bank a pressing necessity. Staff participate in bank selection at the beginning of the year, awaiting hiring requirements for acute care specialties to advance quickly to higher title levels.

3.3 Supermarket Operation of Manpower Management Improves Specialized Nursing Care Quality

Our findings demonstrated that following implementation, nurses' understanding of patient conditions, health promotion effectiveness, and patient satisfaction with nursing care all increased. Nurses collaborated on nursing tasks, content, procedures, and human resources to assure execution of all nursing duties and enhance quality. The study amply demonstrates how closely the manpower management model adheres to both employing firm needs and nursing staff's personal development objectives, becoming a motivating factor that increases work motivation and relieves patient difficulties [10]. By actively understanding patient situations, executing correct health education, and adopting acceptable, efficient nursing measures, nurses support patients' early recovery.

3.4 Supermarket Operation of Human Resources Management Aids in Achieving Precise Manpower Assistance

The number and quality of manpower are cornerstones for guaranteeing rapid, safe emergency care during public emergencies [11]. Following a public emergency, the nursing department swiftly evaluates reserve bank staff expertise and knowledge, executing specialized online and offline training. Intensive training in emergency critical care first aid and transport under emergency circumstances improves assistance accuracy and security. Our findings show the hospital completed assistance missions for Hubei Province, Shanghai City, Hainan Province, Zhenxiong County, and Nanjing Public Health Center from 2020 to 2022, all achieving "zero infection and safe return."

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Note: Figure translations are in progress. See original paper for figures.