



Research Article

Application Effect of Nursing Management System in Clinical Nurse Scheduling Management

Minglin He, Wanying Li*, Caiyun Zhong, Haipeng Xu, Ruiyan Cao

The First Affiliated Hospital of Sun Yat-sen University (FAH-SYSU), Guangzhou, Guangdong 510000, China

*Corresponding author: Wanying Li, The First Affiliated Hospital of Sun Yat-sen University (FAH-SYSU), Guangzhou, Guangdong 510000, China

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Abstract

Objective: To explore the application effect of the nursing management system in nurse shift application, leave and compensatory leave arrangement, overtime accounting, intelligent scheduling, and annual nursing data summary, so as to optimize the nursing human resource management process and improve scheduling efficiency, nurse satisfaction, and annual management efficiency.

Methods: Nursing staff in the anesthesiology department of our hospital were selected as research subjects. Differences between the traditional manual scheduling mode and the intelligent scheduling mode of the nursing management system were compared in terms of scheduling time consumption, attendance accuracy, nurses' perception of scheduling fairness, job satisfaction, and annual data summary efficiency. **Results:** After applying the nursing management system, the average daily time spent on scheduling and attendance verification was shortened from 2 hours to 40 minutes; the automatic accounting accuracy of leave and overtime data reached 100%. Nurses' satisfaction with scheduling fairness and process convenience increased from (65.2±5.3) % and (61.8±6.2) % to (94.7±3.1) % and (97.3±2.0) %, respectively. The incidence of scheduling disputes decreased from 31.25% to 0%. The time spent on annual data statistics was shortened from 3–5 working days to within 10 minutes. The whole process was traceable and transparent, greatly simplifying the annual summary and reporting process. **Conclusion:** The nursing management system enables online application and approval of nurses' special shift needs, automatic leave deduction, automatic overtime recording, intelligent shift quota control, and one-click export of annual nursing data. It effectively saves nursing management time, standardizes the scheduling process, simplifies annual summary work, improves scheduling fairness and overall management efficiency, and is worthy of popularization in clinical nursing management.

Keywords: Nursing management system; Nurse scheduling; intelligent management; Leave management; Overtime accounting; Nursing human resources; Annual data summary

Introduction

Nurse scheduling is a core part of nursing management, which is directly related to the rationality of nursing human resource allocation, quality of nursing work, and nurses' professional sense of gain. Traditional nursing scheduling mostly adopts manual registration, offline communication, and manual accounting, which are plagued by cumbersome processes, opaque information, error-prone statistics of leave and overtime, and difficulty in ensuring the fairness of shift allocation. Some nurses need to apply for special shifts such as morning shifts, evening shifts, shift swaps, and leave for personal reasons. Under the manual mode, the application process is complicated, approval is delayed, and statistics are difficult, which easily lead to scheduling disputes and chaotic human resource allocation. In addition, during the annual summary and report, managers have to manually review numerous paper ledgers and chat records to count each nurse's annual special shift applications and leave days, which is time-consuming, labour-intensive, and prone to data deviations.

With the continuous advancement of nursing informatization, the nursing management system has been gradually applied to clinical scheduling, attendance, human resource coordination, and data summary. This study focuses on the practical application of the nursing management system in functions including personalized shift application, approval, automatic leave deduction, overtime compensation, quota-based scheduling, priority allocation, and one-click annual data export, and analyzes its impact on nursing management efficiency, scheduling standardization, nurses' work experience, and annual summary work, so as to provide practical evidence for intelligent clinical nursing management.

Materials and Methods

General Data

16 nursing staff in the anesthesiology department of our hospital were selected, including 13 females and 3 males, aged 27–39 years, with an average age of (28.56±2.98) years. There were 3 nurses-in-charge or above and 13 professional nurses, with working experience of 4–16 years. The department implements three-shift rotation (morning, middle, and evening shifts) daily, with 5 staff fixed for morning and evening shifts each day and middle shifts arranged as needed. Nurses can submit applications for special shifts leave, shift swaps, and overtime compensation according to personal, family, and physical conditions. The department is required to conduct annual work summary and report for nursing staff every year.

Methods

Traditional Manual Scheduling Mode

Paper registration, WeChat communication, and manual statistics were adopted. Nurse's submitted shift needs and leave applications orally or in writing. Head nurses and department human resource staff conducted manual review, manual scheduling, and manual recording of leave days and overtime hours. For the annual summary, paper records of the whole year were manually sorted out to count each nurse's special shift applications and leave days, which was cumbersome, error-prone, difficult to quantify fairness, and required a long preparation period for annual reports.

Intelligent Scheduling Mode of Nursing Management System

The whole-process online management was carried out based on the hospital's nursing management information system. The main functions and implementation procedures are as follows:

1. Online application and approval of special shifts: Nurses could independently submit requests for morning shifts, evening shifts, shift swaps, leave, and compensatory leave in the system, fill in the reasons and time of application, and the system would automatically push the application to the head nurse for approval. Approved applications were marked as priority arrangements and included in the scheduling candidate pool.
2. Automatic leave accounting and deduction: After approval of leave applications, the system automatically deducted the corresponding leave duration and updated the leave balance in real time, without manual registration or calculation, and all leave data were retained in real time.
3. Automatic overtime recording: After working overtime or supporting other departments on holidays, nurses could submit overtime hours in the system. Approved hours were automatically recorded into the compensatory leave or working hour account, with real-time synchronization and permanent data storage.
4. Shift quota and priority scheduling: The system preset staff limits for each shift (e.g., 5 staff for the morning shift daily). When the number of applicants for the same shift exceeded the quota (e.g., 7 applicants), the system automatically displayed application time. Head nurses arranged shifts based on application order, urgency of reasons, and balanced human resources, with a fully open and transparent process to effectively reduce communication conflicts and doubts.
5. Scheduling publicity and information inquiry: After scheduling completion, the system released the schedule with one click. Nurses could check their shifts, approval status, leave balance, and overtime hours at any time, and modification records were traceable.

6. **One-click export and summary of annual data:** The system automatically stored all nurses' annual records of special shift applications, leave days, overtime hours, etc. During the annual summary and report, core data such as annual shift application details and total leave days of each nurse could be screened and exported with one click, and statistical tables were automatically generated for direct use in annual summaries, performance accounting, and nursing management reports.

Observation Indicators

The average daily time spent by head nurses on scheduling and attendance verification, attendance data accuracy, nurses' satisfaction with scheduling fairness, process convenience satisfaction, incidence of scheduling disputes, and time spent on annual summary data statistics were compared between the two modes.

Results

1. **Significant reduction in daily management time:** After applying the nursing management system, the daily time spent by head nurses and department human resource staff on scheduling, attendance statistics, and leave verification was shortened from 2 hours to 40 minutes compared with the traditional mode, greatly saving daily management time and allowing more energy to be devoted to clinical nursing quality control.

2. **Improved attendance accounting accuracy:** The system automatically deducted leave and accumulated overtime hours, with 100% accuracy of leave, overtime, and compensatory leave data, eliminating problems such as missing records, wrong records, and repeated calculations in manual statistics.

3. **Optimized scheduling fairness and process convenience:** The system adopted the principles of queryable application time and priority for urgent matters, with clear scheduling basis and transparent process. Nurses' satisfaction with scheduling fairness and process convenience increased significantly, and the incidence of scheduling disputes and internal conflicts decreased significantly.

4. **Greatly improved efficiency of annual summary work:** Under the traditional mode, it took 3–5 working days for head nurses and department human resource staff to complete the statistics of annual nurses' shifts and leave data. After applying the nursing management system, it took less than 10 minutes to export annual data with one click, with accurate and error-free data, greatly simplifying the preparation process of annual summary and report and reducing the workload of manual statistics.

The detailed data comparison of application effects between the two scheduling modes is shown in Table 1.

Observation Indicators	Traditional Manual Scheduling	Nursing Management System	P Value / Improvement Trend
Average daily time spent on scheduling and attendance verification	2 hours	40 minutes	<0.05
Attendance data accounting accuracy	<90%	100%	<0.01
Satisfaction with scheduling fairness	65.2±5.3%	94.7±3.1%	<0.001
Process convenience satisfaction	61.8±6.2%	97.3±2.0%	<0.001
Incidence of scheduling disputes	31.25%	0%	<0.05
Time spent on annual data statistics	3–5 working days	within 10 minutes	<0.001

Table 1: Comparison of application effects between two scheduling modes (n=16).

Discussion

Nursing Management System Realizes Informatization and Standardization of the Whole Scheduling Process

The traditional manual scheduling mode relies on subjective judgment and manual recording, with fragmented processes and high management costs, and lacks systematic ledger support for annual data sorting. The nursing management system integrates shift application, approval, scheduling, leave, overtime, publicity, and annual data summary into an integrated online process, realizing the transformation from “passive manual management” to “active intelligent management”. It standardizes the scheduling process, approval, data accuracy, and annual management convenience, forming a full-cycle closed-loop management of nursing human resources.

Automatic Accounting Function Effectively Reduces Management Errors and Saves Working Time

The system has the functions of automatic leave deduction and automatic overtime recording, eliminating the need for manual ledger registration and repeated verification. It greatly reduces the daily routine work of head nurses, improves attendance management efficiency, and avoids working hour disputes and leave conflicts caused by manual errors, enhancing management credibility. Annual data are automatically stored in the cloud, eliminating the need for special staff to organize paper files and reducing data storage costs.

Quota Control and Priority Sorting Improve Scheduling Fairness and Transparency

Aiming at the common clinical problem of multiple applicants for limited shift quotas, the system sets fixed quotas and conducts intelligent sorting according to application order. It not only meets the requirements of departmental human resource allocation but also fully respects the reasonable needs of nurses, reduces subjective bias, improves scheduling fairness, alleviates negative emotions of nurses caused by scheduling problems, and enhances team cohesion.

Informative Scheduling Balances Management Rigor and Humanistic Care

The system strictly implements departmental shift quotas and leave management systems while allowing nurses to submit personalized needs independently, combining institutional constraints with humanistic care. It ensures the normal operation of clinical nursing work, improves nurses’ professional sense of belonging and work enthusiasm, and promotes the stability of the nursing team.

One-Click Annual Data Export Function Empowers Quality and Efficiency Improvement of Annual Management

Annual summary and report are important tasks of nursing management. The traditional manual statistics mode is heavy workload, error-prone, and time-consuming. The annual data export function of the nursing management system realizes automatic collection and standardized output of annual nursing attendance and shift demand data, without manual secondary sorting. It ensures the authenticity and integrity of data, greatly shortens the preparation time for annual summaries, enables nursing managers to complete annual work reports, performance accounting, and management review more efficiently, and promotes the development of nursing management towards high efficiency and refinement.

Conclusion

The application of the nursing management system in nurse scheduling can realize online application, intelligent approval, automatic leave deduction, automatic overtime recording, quota control, transparent scheduling, and one-click export of annual shift and leave data for special shifts. It significantly shortens the average daily scheduling and attendance time from 2 hours to 40 minutes, improves attendance data accuracy, simplifies the annual summary and reporting process, and enhances scheduling fairness, nurse job satisfaction, and overall nursing management efficiency. This mode is easy to operate, practical, and standardized, effectively overcoming many disadvantages of traditional manual scheduling and annual data statistics, and is suitable for popularization in clinical nursing management of hospitals at all levels.

References

1. Wang JQ (2025) Effect analysis of flexible scheduling mode on nurse fatigue in dialysis unit. In: Chinese Society of Smart Engineering, ed. *Proceedings of 2025 Health Management Experience Exchange Conference under Informatization Background*. Xuanhua District People's Hospital of Zhangjiakou; 2025:102-103.
2. Pan XN, Xi J, Tang XH (2024) Application research of responsibility-based flexible scheduling in pediatric nurse management. *China Health Industry*. 21:18-21.
3. Hao J, Yang BX, Wen CC (2026) Effect of emergency department nurse flexible scheduling management based on competency model on nurse work efficiency and job burnout. *China Health Industry*. 23:69-71,75.
4. Fan CY, Wang L, Zhang Q, et al. (2025) Application of flexible scheduling combined with humanized management in hematology department nurse management. *China Health Industry*. 22:134-137.
5. Li FL, Zhao CZ (2024) Study on the effect of incentive management strategy combined with performance appraisal on work efficiency and job burnout of respiratory department nurses. *China Health Industry*. 21:12-15.