

# Application of Intelligent Information Platform in Improving Nursing Efficiency

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**Abstract.** The information age is coming, people's lifestyle, psychological state have undergone great changes. Modern hospital management is a new management mode with information as the core, and nursing staff, as the main body of the implementation of the whole system, shoulder the heavy daily management work, and its position is becoming more important. At present, many hospitals still lack a set of perfect information management system, resulting in a lot of work cannot be implemented; it cannot ensure the improvement of work efficiency. This paper aims to discuss the design and implementation method of intelligent medical care management system under the Internet of Things (IoT) and other information technology, and illustrate the superiority and practical feasibility of this application mode through examples. It is hoped that the efficiency of medical staff can be significantly improved, so that nursing staff can better provide high-quality services for patients, and promote the vigorous development of medical and health undertakings. A comparative experiment was designed to evaluate the nursing effect of the intelligent information platform. The patients receiving the assistance of the intelligent information platform were called group A, and those receiving the traditional intracardiac care were called group B. The experimental results show that the triage success rate of group A is about 2.51% higher than that of group B, and the qualified rate of nursing quality is also increased by about 2.95%, which proves that the information platform can effectively improve the enthusiasm and efficiency of nursing staff. Relying on intelligent information platform for nursing management is an inevitable requirement for the continuous development and construction of modern hospitals, which provides a strong guarantee for improving the work quality and efficiency of nurses, reducing medical costs and ensuring patient safety.

**Keywords:** Smart Medical Care, Information Platform, Nursing Efficiency, Cardiology Nursing, Internet of Things

## 1. Introduction

People's living standards are getting higher, the concept of health is deeply rooted in people's hearts, and the demand for high-quality medical services is also increasing, and hospitals take meeting the needs of patients as the starting point and landing point

of all work, and nursing work has become a more critical link in clinical departments. Modern information science and technology has created a more convenient and effective way of communication for human beings, greatly promoted the progress of medical career, but also made the traditional doctor-patient relationship has undergone great changes, and the role of nurses has changed from a simple assistant to a service provider. Nursing staff must adapt to this new climate, update ideas, and constantly innovate technology and methods in order to better undertake clinical diagnosis and treatment work.

Cardiovascular disease is a key reason of death, morbidity, disability, reduced quality of life, and economic burden worldwide. As more people with symptomatic conditions live longer, the effectiveness and availability of secondary prevention and rehabilitation health services are in focus [1]. He reviewed the clinical data of fetuses undergoing echocardiography at the Fetal Heart Medical Center. He analyzed the location of intracardiac echo lesions and fetal heart abnormalities, and found that the incidence rate on the right side was significantly higher than that on the left or bilateral lesions [2]. In order to confirm whether hypoxemia can be explained by intracardial shunt or intrapulmonary shunt of COVID-19 pneumonia-associated acute respiratory distress syndrome, the treatment and nursing of critically ill patients admitted to the intensive care unit can be evaluated by comparing transthoracic echocardiography evaluation of PTE and pulmonary bubble transport [3]. Transthoracic intracardiac catheters are central catheters placed at the end of cardiac surgery in children, but their care management, including catheter bandaging, fixation, and cleaning, patient activity, and prognosis, has not been recommended [4]. Qualified and efficient intracardiac care can reduce the chances of postoperative complications, increase hospital stay and improve patients' vital signs.

Sex chromosomes and sex hormones have an impact on blood pressure regulation, cardiovascular and other functions, and women have an increased risk of cardiovascular disease at lower blood pressure levels [5]. Cardiovascular care has long been regarded as the key to improving patients' quality of life and reducing adverse events. Evaluation of nurses' attitudes and beliefs in evidence-based nursing and their supporting factors are crucial to assist in training practice in clinical settings [6]. Cardiovascular disease risk assessment is the key to predicting cardiovascular mortality or lifetime risk in different populations. The accurate evaluation of cardiovascular disease risk algorithm provides the basis for formulating reasonable intervention strategies [7]. Because the components and burden of frailty can vary across cardiovascular diseases and clinical settings, and therefore vary from individual to individual. Understanding these issues allows specialists to focus more clearly on the vulnerability of cardiovascular disease, leading to more targeted clinical decisions and treatment choices for outpatients [8]. Nursing is a highly practical discipline, which not only needs to meet the various medical services needed by patients in the process of disease treatment and rehabilitation, but also needs to ensure the patient's daily life and mental comfort.

The construction of intelligent information platform has surfaced, and smart medical treatment uses advanced technologies such as IoT and big data to combine with the Internet to provide a new operation model and service mode for hospitals [9]. Smartphones and smartwatches, activity trackers and e-health apps are increasingly being used in the leisure and healthcare sectors. The use of wearable devices supports

activity tracking such as heart rate in clinical cardiovascular care [10]. A secure healthcare system that combines IoT with blockchain has huge advantages in supporting remote patient care and data collection, and scalability and processing times are further improved [11]. The passive security mechanism used in the traditional medical platform cannot provide adequate protection for the healthcare system deployed in a distributed way. While the new protection framework built on the basis of modern information technology can provide all-round and multi-link protection for medical care without increasing the cost and workload [12]. In healthcare, IoT devices are able to provide real-time sensing data from patients for processing and analysis, and intelligent information platforms that combine IoT with blockchain can also be used to store, access, and manage electronic medical data [13]. The nursing information system optimizes and integrates the existing medical workflow and resources of the hospital, thereby improving work efficiency, reducing labor costs and improving service quality.

The traditional nursing process lacks of modern professional consciousness and professional technical ability, resulting in some nurses in the implementation of various tasks have a certain degree of blindness, randomness and irregularity, which directly affects the satisfaction of patients. The establishment of an intelligent information platform can maximize the integration of resources, realize a series of functions such as information sharing, resource sharing, and optimization of resource allocation, and improve the quality of care and management level by providing humanized services. It is a new trend in the development of nursing management in many medical institutions, and it is also a necessary means to promote the sustained and rapid development of medical and health undertakings.

## **2. Role of Information Construction in Nursing Work**

Nursing is a discipline with strong practicality and a close combination of theory and practice, which requires nurses to have certain professional skills and comprehensive quality, especially in intracardial nursing work, more attention should be paid to the cultivation of psychological quality and skills of nursing staff [14-15]. Computer and network technology as modern information dissemination tools, its application in clinical treatment, scientific research and management, has a wide range of advantages. It can provide all kinds of services needed by patients to every medical staff through the information network, so as to achieve "patient-centered". It truly reflects the people-oriented, and can also enable nurses to master more advanced medical knowledge, medical concepts and diagnosis and treatment methods, improve patient satisfaction and reduce complications.

First of all, the standardization and automation of nursing work can be achieved through information construction, so as to reduce the frequency of manual operation and repetitive work, and improve work efficiency. In the nursing information system, the clinical data can be collected in real time, and the data can be displayed visually in the form of graphics, so as to provide timely and accurate decision basis for hospital managers. At the same time, the electronic medical record system also provides nurses with an efficient way to record and query medical record information, thus effectively reducing the management and storage costs of paper medical records,

reducing labor costs, and shortening the communication time between nurses and patients.

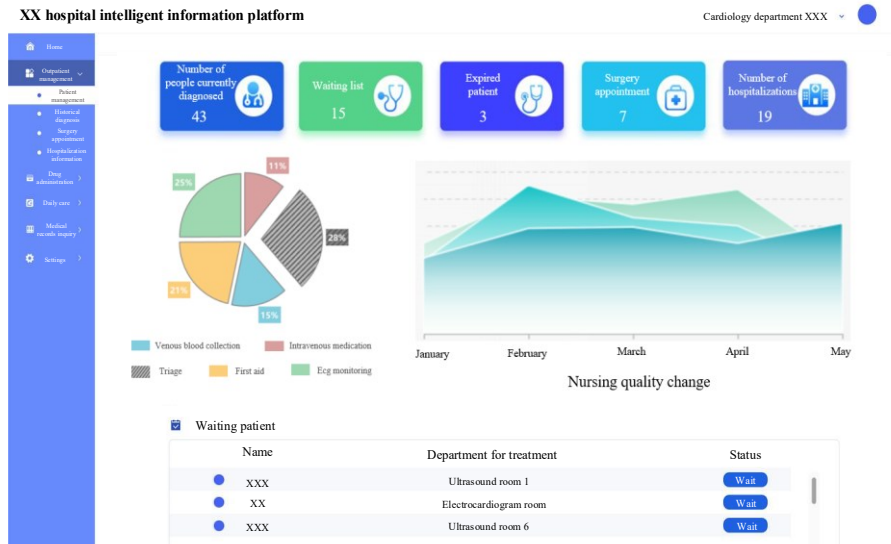
Secondly, the further promotion of information construction can effectively enhance the quality and safety of nursing services. With the help of the information system, the nursing staff can obtain the patient's condition information, medical advice and nursing plan in real time, so as to perform the nursing duty more efficiently. In the implementation process, the nurse can also grasp the dynamic situation of the patient at any time, and provide support for the medical staff to formulate treatment plans and nursing measures. In addition, the information system can not only provide patients with health management and early warning services, but also create a superior medical environment for patients, timely detect and deal with patients' health problems, and ensure that patients' vital signs remain normal.

Third, nursing research, driven by the construction of information technology, has been able to obtain data support and analysis tools, thus promoting its continuous development and growth. When carrying out various medical activities, hospitals must fully consider various potential risk factors, especially in the diagnosis and treatment of diseases, which often need to rely on the support and elimination of medical technology. With the help of electronic medical record system, patients' medical record data can be easily obtained, and in-depth data analysis and mining can be carried out, so as to provide reliable data support for nursing research.

Finally, through information construction, communication and interaction between doctors and patients can be effectively improved, thus enhancing the harmonization of doctor-patient relationship [16]. At present, most hospitals have established information systems and put them into operation, but there are still many problems, which cause information asymmetry and resource waste in the process of medical service. Through the information system, patients can easily obtain medical information and health knowledge, and carry out online consultation and communication with medical personnel, so as to have a more comprehensive understanding of their own health status and treatment plans, and prevent and control various medical disputes more efficiently. This is the Internet has convenient, safe, reliable, efficient and other characteristics.

### **3. Establishment of Nursing Information Platform**

Modern science and technology continue to grow, the communication and cooperation between various departments in the hospital are more close, and "patient first" has become a widely recognized and recognized service concept. As nurses, in order to better complete various clinical tasks, they must learn to use various modern intelligent information technology means to provide high-quality and efficient services for patients [17]. The establishment of nursing information platform is a new type of information system that meets this requirement. It is a key means to realize humanized management, improve the quality of medical service and optimize the allocation of resources, as well as a key measure to realize the standardization of medical management [18]. A detailed introduction to the platform is shown in Figure 1.



**Fig.1** Nursing information platform

There are 4 functional modules commonly used in this platform, which are outpatient management, medication management, daily nursing and medical record information inquiry, among which outpatient management is the most perfect. It includes patient management, pre-treatment appointment registration, hospitalization settlement, discharge procedures, inspection and laboratory report generation, historical diagnosis record query and other process operations, and provides corresponding statistical information for doctors and nurses to provide convenience. Drug management covers prescription review, execution of medical orders, adverse drug reaction monitoring, drug allocation, use, storage and other contents to ensure the safety and efficiency of hospital drugs. In addition to routine treatment, daily care also involves a variety of special projects such as psychological counseling, family care, etc., to bring meticulous care to patients, so that they can restore healthy life in the shortest time.

Through the cooperation between these modules, it can conduct comprehensive information collection, registration and statistics of patients, and timely feedback the results to relevant personnel. At the same time, it can also enable medical staff to understand the information of patients' conditions and treatment, so as to implement reasonable and effective diagnosis and treatment for them more accurately [19-20].

## 4. Evaluation of Application Effect of Intelligent Information Platform in Intracardiac Nursing

### 4.1 Experimental Design

Randomized controlled experiment design was used to evaluate the application effect of intelligent information platform in cardiac nursing through the implementation of

patient intervention and health education, which is of exceptional value to improve patient satisfaction, reduce the incidence of complications and improve the quality of nurses' work.

#### 4.2 Experimental Subjects

A total of 52 patients in the Department of Cardiology admitted to a hospital in the past three months were used as the main assessment objects. The age of these patients was basically distributed from 18 to 70 years old, with an average age of  $48.6 \pm 3.1$  years old. The proportion of men and women was roughly equal, and all patients had varying degrees of heart disease.

#### 4.3 Experimental Methods

In this paper, the experimental subjects were divided into two groups, A and B, with 26 people in each group. Group A received cardiac care assisted by intelligent information platform, including the use of intelligent devices, applications or software to monitor patients' physiological parameters and provide personalized nursing suggestions. Group B received traditional intracardiac care, such as the usual care measures and guidance.

#### 4.4 Evaluation Indicators

The evaluation indicators set in this paper include three aspects: treatment time, nursing quality and satisfaction degree. By comparing the difference between the values of each group, this paper reflects the degree of influence of different nursing methods on the change of patients' condition and quality of life, so as to provide reference for clinical rational drug use and patient rehabilitation.

#### 4.5 Data Analysis

##### 4.5.1. Treatment Time

There are multiple links in the whole treatment process of patients. The triage time and ECG monitoring time of each group are counted, and the results are shown in Figure 2.

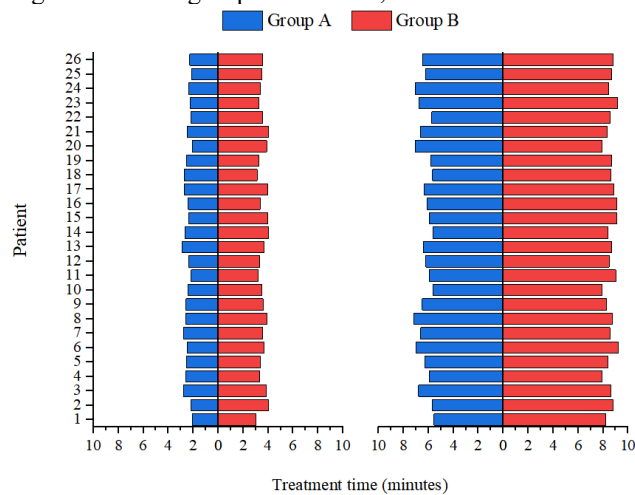
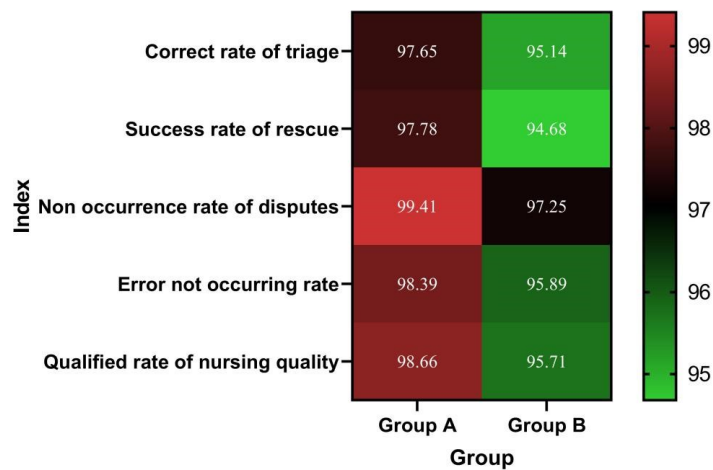


Fig.2 Comparison of treatment time between the two groups

In Figure 2, the horizontal coordinate represents the time, and the vertical coordinate represents the patient. The left image represents the triage time, and the right represents the ECG monitoring time. It can be seen that the triage time of group A is less than 4 minutes, that of group B is less than 5 minutes, and the average triage time of group A is about 2.45 minutes, and that of group B is about 3.58 minutes. The duration of ECG monitoring in group A was less than 8 minutes, and that in group B was less than 10 minutes. The average duration of ECG monitoring in group A was about 6.28 minutes, and that in group B was about 8.6 minutes. It can be seen that group A has certain advantages compared with group B, which can better meet the needs of patients for intracardiac nursing. Based on the intelligent information platform, diagnosis and treatment plans and related information can be provided to patients faster and more accurately.

#### 4.5.2. Quality of Care

The nursing quality of each group was analyzed according to the statistical results from five perspectives: correct rate of triage, success rate of rescue, incidence of disputes, incidence of errors and qualified rate of nursing quality. The results were shown in Figure 3.



**Fig.3** Comparison of quality of care between the two groups

In Figure 3, the horizontal axis represents the two groups A and B, and the vertical coordinate represents the 5 indicators including the correct rate of triage. The more red the color in the image, the higher the value, and the more green the value, the lower. It can be seen that both groups have a higher incidence of disputes, among which the highest value of group A is 99.41%, group B is 97.25%, and group A is 2.16% higher than group B. After careful calculation, the triage success rate of group A is about 2.51% higher than that of group B, the rescue success rate is about 3.1% higher, the incidence of error is about 2.5% higher, and the qualified rate of nursing quality is about 2.95% higher. Therefore, in summary, the application of intelligent information platform can effectively improve the level of hospital management and service,

reduce the probability of medical accidents, and is worthy of clinical application and promotion.

#### 4.5.3. Satisfaction

The patients in the two groups were invited to score their satisfaction with the care respectively. The full score is 100, and the results are shown in Figure 4.

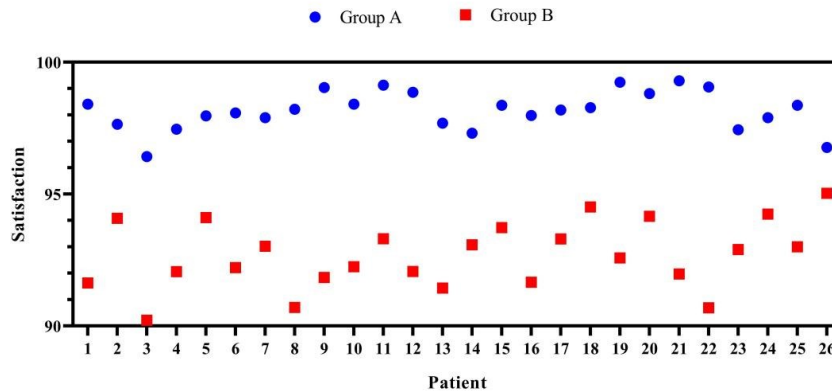


Fig.4 Comparison of nursing satisfaction between the two groups

In Figure 4, the horizontal axis represents the patients, and the vertical axis represents the satisfaction score. The satisfaction score of group A basically reached more than 95 points, while the highest score of group B was only about 95.03 points, far lower than that of group A. The average satisfaction score of group A was about 98.16 points, and that of group B was about 92.68 points. The nursing plan of group A was more acceptable and the patient satisfaction was higher.

## 5. Conclusions

As a new service model developed in the big data environment in recent years, smart medicine integrates nursing, clinical decision-making and management. The informationized nursing platform based on this construction is more patient-centered, providing personalized health guidance and improving patient experience. At present, through the clinical application of information platform, the working time of nursing staff is saved, the working procedure is simplified, and the work efficiency is improved. This can greatly shorten the distance between doctors and patients, improve the quality of communication, increase affinity and trust, and play a positive role in the overall image of the hospital.

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