*Retraction*

# Retracted: Construction of Nursing Quality Evaluation Index System Based on Big Data Assisted Analysis in the Context of Intelligent Medical Treatment

## Mobile Information Systems

This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope

(2) Discrepancies in the description of the research reported

(3) Discrepancies between the availability of data and the research described

(4) Inappropriate citations

(5) Incoherent, meaningless and/or irrelevant content included in the article

(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

## References

[1] W. Wang, X. Li, J. Chen, and Y. Cui, "Construction of Nursing Quality Evaluation Index System Based on Big Data Assisted Analysis in the Context of Intelligent Medical Treatment," *Mobile Information Systems*, vol. 2022, Article ID 5348629, 7 pages, 2022.

*Research Article*

# Construction of Nursing Quality Evaluation Index System Based on Big Data Assisted Analysis in the Context of Intelligent Medical Treatment

**WanLi Wang** [ID],[1] **Xia Li,**[2] **JunGuo Chen,**[3] and **Ying Cui**[4]

[1]*Nursing Department, Sichuan Vocational College of Health and Rehabilitation, Zigong 643000, SiChuan, China*
[2]*Nursing Department, Sichuan Vocational College of Health and Rehabilitation, Zigong 643000, SiChuan, China*
[3]*Department of Medicine and Food, Sichuan Vocational College of Health and Rehabilitation, Zigong 643000, SiChuan, China*
[4]*Department of Health Policy & Management, College of Health Science, Korea University, Anam-ro, Seongbuk-gu, Seoul, Republic of Korea*

Correspondence should be addressed to WanLi Wang; 41818079@xs.ustb.edu.cn

*Objective.* To improve and ensure the quality of nursing (QOC), scientifically and effectively improve nursing management, and improve the hospital QOC overall level and construction of nursing quality evaluation index suitable for China (NQEI) system. *Method.* This research is based on the fuzzy neural network (FNN) big data analysis technology, and temperature of hospital patients,blood pressure, blood sugar, blood uric acid, and other data were analyzed, assisted by health big data NQEI. With this, in smart medicine (WIT120), under the background of big data assisted analysis NQEI system and the nursing satisfaction index of patients, inpatient management index, quality of inpatient management, and quality of inpatient management, the coupling of four aspects is analyzed. *Result.* The results showed that, in the coupling analysis of nursing satisfaction indicators, using the big data assisted NQEI system, the comprehensive satisfaction of patients with nursing was 0.963, and the complaint rate is −0.963. In the coupling analysis of patient hospitalization management indicators, assisted by big data NQEI, the average length of stay of patients in the system is −0.982, postoperative recovery time is −0.996, and ICU time is −0.892. In the coupling analysis of patient hospitalization management quality, assisted by big data assisted NQEI, the inpatient infection of the system is −0.982, the postoperative rehabilitation time was −0.996, and the ICU time was −0.892. In the coupling analysis of patient prognosis management quality, assisted by big data assisted NQEI, the re-examination compliance rate of patients in the system is 0.997, and the medication compliance rate is 0.995, indicating that it is assisted by the big data NQEI system and has high correlation with real data. *Conclusion.* Through analysis, it is proved that using big data to assist the NQEI system, patients' nursing satisfaction index, inpatient management index, inpatient management quality, and inpatient management quality are better than those using the quality control circle NQEI high system, and the results are credible. However, its clinical application is not perfect and needs further verification.

## 1. Introduction

With the development of information technology and economy, people's living standards have been significantly improved, and the requirements for physical health have begun to improve. Nursing is an indispensable and important part of the health care system. Nurses should not only provide nursing technical services for patients but also meet the reasonable requirements of patients for nursing services. According to Shi Xiaoqing, the nursing quality of medical institutions needs to be improved to improve the nursing quality and ensure the safety of clinical patients [1]. Nursing quality has a direct impact on the clinical medical quality of the hospital, as well as the social image and economic benefits of the hospital. Ma Qiong established the evaluation standard of nursing quality, which is the key link

of nursing quality management and the guarantee of effectively improving nursing quality [2]. Nursing quality (QOC): it determines the safety and rehabilitation of patients, so it is necessary to pass the nursing quality evaluation index (NQEI) to judge nursing work. Chen Rongbin constructed a set of scientific and reliable nursing quality evaluation index system to provide objective and quantifiable evaluation basis for the evaluation of nursing work [3]. Zhang Cuiliu reviewed the definition, theoretical basis, and construction methods of nursing quality evaluation indicators, as well as the research status of nursing quality evaluation indicators in different specialties so as to provide reference for the problems existing in the existing research and the future development direction and for the construction of nursing quality evaluation indicators [4]. Nursing quality evaluation is an important evaluation system to improve nursing quality. It ensures the improvement of nursing quality, provides a basis for whether the nursing quality meets the regulations and standards, and can also provide guidance for the practical work of clinical nurses.

Establish an NQEI system suitable for the Chinese system, it can improve and guarantee QOC, and it can also scientifically and effectively improve nursing management, which is the key to improve the overall level of hospital QOC and the inevitable development of the modern medical model. At present, the rapid development of Internet+ in China has brought about smart medicine (WIT120), breaking through the traditional medical treatment, integrating modern information technology into the medical system through the Internet of Things, realizing the interaction between patients and medical staff, improving medical efficiency, improving service quality, and greatly improving the comprehensive construction of the hospital. Cheng Yuqing relies on the deep integration of the "Internet +" medical and health care service system of the Internet, big data, Internet of Things, and other modern information technologies with traditional medical and health care services. The traditional digital hospital will gradually develop into a smart hospital, which is bound to bring a new medical and nursing service mode and management mode [5]. According to Xu Tingting et al., medical care has always been the focus of people's attention. The improvement of scientific and technological level makes people's demand for medical treatment increase accordingly. The emergence of intelligent medical system makes people's life more convenient and provides more effective security for people [6]. According to Liu Huan, smart medical service provides a complete health service nursing management platform for patients' personal health [7]. Using the intelligent medical big data platform, medical staff can quickly extract patients' medical data and better provide targeted care for patients. Therefore, the application of intelligent medical big data not only improves the overall level of medical quality but also alleviates the problems such as blocked medical information transmission and imperfect medical supervision mechanism.

## 2. Overview

### 2.1. Current Situation of Nursing Quality Evaluation Index System.
Since 1989, China has issued the standard of graded

management of general hospitals. The nursing quality standard of this management standard training is the only nursing quality standard system in China. Due to the reform of China's medical system and the transformation of medical model, the original nursing standards can no longer meet people's current needs for medical care. According to Yu Shumei, there are several problems in nursing quality management, that is, the concept of nursing quality is not strong. The number of nursing staff is seriously insufficient, which is far less than the staffing required by the health management department, making it difficult to improve the quality of nursing. Despite nursing work, the disadvantages of nursing work are gradually increasing [8]. The core content of nursing management is nursing quality management, and the key of nursing quality management is nursing quality standard and evaluation. Through the correct and reasonable nursing quality evaluation system, the problems existing in nursing work can be improved, so that the nursing quality can be continuously improved. According to Liu Yanping et al., with the continuous development of nursing scientific research, the research on nursing quality evaluation has attracted the attention of experts and scholars [9]. With the development of the medical system and the change of patients' demand for nursing services, a unified nursing quality evaluation indicator system is established to meet the needs of different medical personnel and medical institutions for the consistency of quality evaluation so as to better reflect the "patient-centered" service concept. While paying attention to patients' satisfaction with nursing quality, it also improves the management level of China's nursing quality evaluation index system.

### 2.2. Intelligent Medical Treatment.
Smart medicine applies the Internet of Things technology to the medical field, realizes the informatization of patient data, and enables effective interaction between patients and medical personnel, medical institutions, and medical equipment. Zhang Shengnan brings medical services to the cloud through big data and cloud computing technology and designs and analyzes the database of functional modules such as user registration and login, user information management, appointment registration, remote diagnosis, consulting medical information, and personal health file management. The intelligent medical cloud service platform realizes the collaborative sharing of medical service resources and medical data, which helps to alleviate the uneven distribution of medical resources and the inconvenience of medical services [10]. According to Tang Yi, in the "Internet +" era, medical applications based on mobile Internet, big data, cloud platform, Internet of Things, AI, 5G, and other new technologies are emerging, which has brought great innovation to the traditional medical industry and made medical services quickly move towards real wisdom [11]. Intelligent medical treatment enables medical staff to grasp the medical record information of each patient at any time and quickly formulate diagnosis, treatment, and nursing plans. It not only improves the efficiency of diagnosis, treatment, and

nursing but also improves the performance of medical staff and mobilizes the work enthusiasm of medical staff. According to Wang Yezhou, the application of smart medical system is based on big data and mobile Internet technology to realize the reform of China's medical industry and accelerate the pace of medical informatization [12]. According to Tangmiaojun, in the medical industry, "big data aided analysis" has been widely used in the innovative development of hospitals, especially in the recent outbreak of COVID-19. The hospital's informatization has effectively promoted the realization of intelligent medical treatment. This sudden health event has greatly promoted the medical reform [13]. At present, with the rapid development of medical informatization in China, smart medicine has entered people's life. When patients experience one-stop medical and nursing services, they can better enjoy safe, convenient, and high-quality nursing services.

## 3. Big Data Analysis Technology

### 3.1. Patient Health Index Time Series Data and Its Processing Scheme.

The patient's body temperature, blood pressure, blood glucose, and blood uric acid form time series data. With the data acquisition timestamp variable as the independent variable and the measured data as the dependent variable, the measured data are subjected to Z-score dimensionless processing to form a dimensionless sequence, as follows:

$$Z_i = \frac{X_i - \overline{X}}{\sigma},$$

$$\sigma = \frac{1}{n-1} \sqrt{\sum_{i=1}^{n} (X_i - \overline{X})^2}, \quad (1)$$

$$\overline{X} = \frac{1}{n} \sum_{i=1}^{n} X_i.$$

Here, $\overline{X}$ is the arithmetic of the average sequence of $X$; $X_i$ is the value of the $i$th sequence in sequence $x$; $Z_i$ is $X_i$ function output result.

For the obtained data results, the transfinite learning machine algorithm is used to extract the data features, as follows:

$$y = \sum_{i=1}^{n} [A \cdot \sin(Bx_i + C) + D]. \quad (2)$$

Here, $i$ is the pointer variable in the function; $n$ is the node value in the neural network; and $A$ is a regression variable.

### 3.2. Big Data Analysis Technology Based on Fuzzy Neural Network.

The dimensionless sequence performs Fourier transform and extracts the frequency domain characteristic matrix as the input data of the fuzzy neural network (FNN), as follows:

$$F(\omega) = \int_{-\infty}^{+\infty} A \cdot f(t)^{-ie \cdot 2\pi} dt. \quad (3)$$

Here, $\omega$ is the traversal pointer of the frequency variable in the function formula; $A$ is the correction variable; and $F(\omega)$ is the output result of Fourier transform.

The output value of the transfinite learning machine in the above sequential data processing is used as the FNN input data B. The FNN output values of all inspected data are counted, and the node function of fuzzy neural network selects the sixth-order polynomial depth iterative regression function, as follows:

$$y = \sum_{i=1}^{n} \sum_{j=0}^{5} A_j x_i^j. \quad (4)$$

Here, $A_j$ is the coefficient to be regressed of the $j$-th order polynomial, and $j$ is the polynomial order.

## 4. Data and Methods

### 4.1. Research Object and Inclusion Criteria.

Participants: 500 patients who were treated and needed nursing in our hospital from January 2020 to January 2022 were randomly selected as the research objects. There were 274 males and 226 females. The average age was $35 \pm 6.4$ years.

Inclusion criteria: patients in need of care; on the basis of the patient's clear consent, can fully understand the contents of the doctor's order and can answer questions positively; know about this study; and voluntarily cooperate with this study.

Exclusion criteria: severe mental illness, functional failure disorder of important organs, and hearing and visual impairment before admission.

### 4.2. Grouping Method.

The 500 patients were divided into two groups. The reference group adopted the mode of routine quality control circle nursing performance management scheme, that is, the traditional nursing group. The observation group adopted the model of the NQEI nursing performance management scheme assisted by big data. Establish a nursing rehabilitation group with the participation of attending doctors, nurses, nursing staff, and patients. There was no significant difference in age, gender, education level, and marital status between the big data assisted nursing group and the traditional quality control circle nursing group. The two groups were well balanced and comparable.

The routine quality control circle nursing performance management scheme is a small circle group automatically composed of people in the same or similar workplaces to solve the problems according to a certain activity procedure around a certain work theme.

The big data assisted NQEI nursing performance management scheme is to combine the big data assisted NQEI to form a unified management data center and timely design perfect medical and nursing schemes for patients facing different medical businesses through reasonable data governance.

This study reflected the expectation and perception of 500 patients on the quality of hospital nursing service from the aspects of comprehensive satisfaction, complaint rate, re-examination compliance rate, and medication compliance rate through the evaluation method of questionnaire and calculated the score of hospital nursing service quality through the feedback of patients' average length of stay, postoperative rehabilitation time, ICU time, hospitalization infection rate, ventilator pneumonia rate, and postoperative wound infection rate, from the score of hospital nursing service quality fed back by patients; the patient's satisfaction with nursing can be seen through the comparison of data of high and low scores. The current situation of hospital nursing service quality evaluation is clarified, so as to improve the nursing service quality and better construct the nursing quality evaluation index system.

*4.3. Statistical Methods.* In order to verify the data results of nursing quality under smart medical big data, the linear regression method under SPSS is used to calculate the $R^2$ value, and the bivariate $t$-test is used to calculate the $t$ value. The statistical method of $R^2$ value is as follows:

$$R^2 = \frac{\sum_i (x_i - \overline{x})}{\sum_i (x_i - \widetilde{x}_i)},$$

$$\overline{x} = \frac{1}{n} \sum_{i=1}^{n} x_i. \tag{5}$$

Here, $\widetilde{x}_i$ is the $i$th regression value in the basis function sequence; $x_i$ is the input data for function $i$; and $n$ is the number of investigation samples of the function formula.

The bivariate $t$ check under SPSS is

$$t = \frac{\mu_1 - \mu_2}{\sqrt{(n_1 - 1)\sigma_1^2 + (n_2 - 1)\sigma_2^2/n_1 + n_2 - 2 \cdot (1/n_1 + 1/n_2)}}. \tag{6}$$

Here, $\mu_1$ and $\mu_2$ is the average of the compared series of correlation functions; $n_1$ and $n_2$ is the number of elements of the comparison sequence in the correlation function formula; and $t$ is the verification result of the basis function.

## 5. Results

*5.1. Coupling Analysis of Nursing Satisfaction Indicators.* In the context of smart medicine, based on the assistance of big data, analyze and build a standardized nursing quality evaluation index system, so as to provide reference for regions and hospitals at different stages of development. Through the comparison of the coupling analysis of nursing satisfaction indicators of two different nursing quality evaluation index systems, it can be seen that the coupling of nursing satisfaction indicators assisted by big data is higher than that under the previous quality control circle. Based on the comparative analysis of the coupling analysis of nursing satisfaction indicators of two different nursing quality evaluation index systems, Table 1 is obtained.

TABLE 1: Coupling analysis data of the nursing satisfaction index.

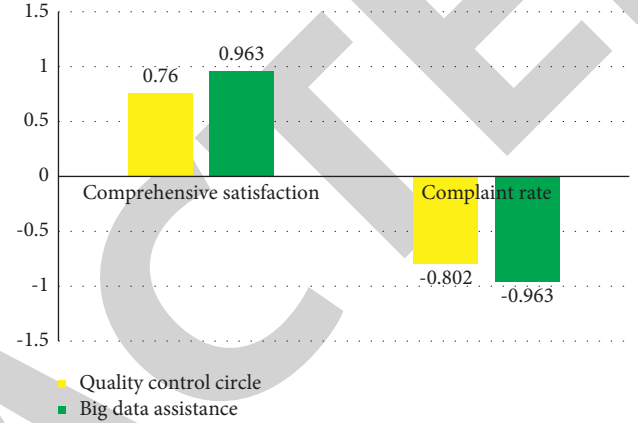| Group | Comprehensive satisfaction | Complaint rate |
|---|---|---|
| Quality control circle | 0.76 | −0.802 |
| Big data assistance | 0.963 | −0.963 |
| $t$ | 2.694 | 3.681 |
| $P$ | 0.008 | 0.006 |



FIGURE 1: Visualization of coupling analysis of nursing satisfaction indicators.

In Table 1, through the comparison of the coupling analysis results of nursing satisfaction indicators under two different nursing quality evaluation index systems, it is found that, in the coupling analysis of nursing satisfaction indicators, using the big data assisted NQEI system, the comprehensive satisfaction of patients with nursing is 0.963 and the complaint rate is −0.963, indicating that the reliability of the big data assisted NQEI system is high.

In order to better reflect the comparison results of the coupling analysis of nursing satisfaction indicators under two different nursing quality evaluation index systems, the data comparison results in Table 1 are visualized, and Figure 1 is obtained:

Figure 1 shows the comparison results of the coupling analysis of patient hospitalization management indicators under two different nursing quality evaluation index systems. It is considered that the comprehensive satisfaction under the application of big data is significantly higher than that under the previous application of quality control circle, and the complaint rate under the application of big data is significantly lower than that under the previous application of quality control circle, which can better improve the comprehensive satisfaction and greatly reduce the hospital complaint rate.

*5.2. Coupling Analysis of Inpatient Management Indicators.* Through the comparison of the coupling analysis of patient inpatient management indicators under two different nursing quality evaluation index systems, it can be seen that the coupling of patient inpatient management indicators

TABLE 2: Coupling analysis data of inpatient management indicators.

| Group | Average length of stay | Postoperative rehabilitation time | ICU time |
|---|---|---|---|
| Quality control circle | −0.714 | −0.756 | −0.452 |
| Big data assistance | −0.982 | −0.996 | −0.892 |
| $t$ | 3.671 | 2.395 | 0.002 |
| $P$ | 0.007 | 0.006 | 0 |

under the assistance of big data is higher than that under the previous quality control circle. Based on the comparative analysis of the coupling analysis of patient hospitalization management indicators of two different nursing quality evaluation index systems, Table 2 is obtained.

In Table 2, through the comparison of the coupling analysis results of patient hospitalization management indicators under the two different nursing quality evaluation index systems, it is found that, in the coupling analysis of patient hospitalization management indicators, the average hospitalization time of patients using the big data assisted NQEI system is −0.982, the postoperative rehabilitation time is −0.996, and the ICU time is −0.892, indicating that the big data assisted NQEI system has a high correlation with the real data.

In order to more intuitively reflect the comparison results of the coupling analysis of patient hospitalization management indicators under two different nursing quality evaluation index systems, the data comparison results in Table 2 are visualized, and Figure 2 is obtained.

Figure 2 shows the comparison results of the coupling analysis of patient hospitalization management indicators under two different nursing quality evaluation index systems. It is considered that the average hospitalization time, postoperative rehabilitation time, and ICU time under the application of big data are significantly shorter than those under the previous application of quality control circle, which can better reduce the average hospitalization time of patients in the hospital postoperative rehabilitation time and ICU time.

*5.3. Coupling Analysis of Inpatient Management Quality.*
Through the comparison of the coupling analysis of patient inpatient management quality of two different nursing quality evaluation index systems, it can be seen that the coupling of patient inpatient management quality under the assistance of big data is higher than that under the previous quality control circle. Based on the comparative analysis of the coupling analysis of patient hospitalization management quality of two different nursing quality evaluation index systems, Table 3 is obtained.

In Table 3, through the comparison of the coupling analysis results of patient hospitalization management quality under the two different nursing quality evaluation index systems, it is found that, in the coupling analysis of patient hospitalization management quality, the inpatient infection of patients using the big data assisted NQEI system is −0.982, the postoperative rehabilitation time is −0.996, and the ICU time is −0.892, indicating that the big data
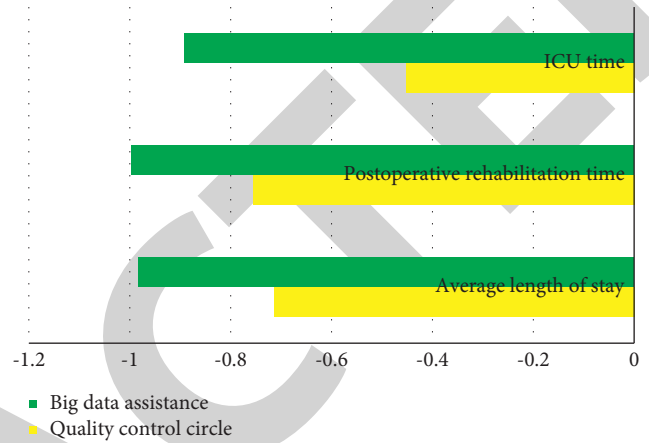


FIGURE 2: Visualization of coupling analysis of patient hospitalization management indicators.

assisted NQEI system has a high correlation with the real data.

According to the data in Table 3, the comparison results of patient hospitalization management quality coupling analysis under two different nursing quality evaluation index systems are visualized, and Figure 3 is obtained.

In Figure 3, we can more intuitively see the comparison results of the coupling analysis of patient inpatient management indicators under two different nursing quality evaluation index systems. It is considered that the inpatient infection, ventilator pneumonia, and postoperative wound infection under the application of big data are significantly lower than those under the previous application of quality control circle, ventilator pneumonia, and postoperative wound infection, which can further reduce the inpatient infection, the probability of ventilator pneumonia, and postoperative wound infection.

*5.4. Coupling Analysis of Patient Prognosis Management Quality.* The treatment effect of patients is affected by many factors, including recheck compliance and medication compliance. The higher the degree of compliance, the better the treatment effect. Through the comparison of the coupling analysis of patient prognosis management quality of two different nursing quality evaluation index systems, it can be seen that the coupling of patient prognosis management quality assisted by big data is higher than that under the previous quality control circle. Based on the comparative analysis of the coupling analysis of patient prognosis management quality of two different nursing quality evaluation index systems, Table 4 is obtained.

TABLE 3: Coupling analysis data of inpatient management quality.

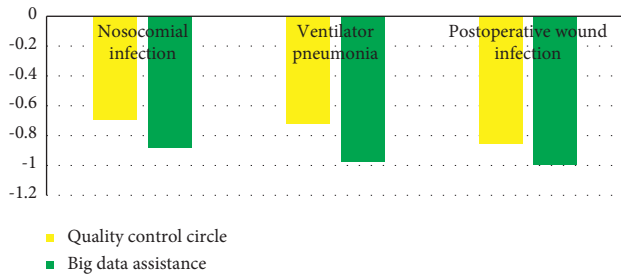| Group | Nosocomial infection | Ventilator pneumonia | Postoperative wound infection |
|---|---|---|---|
| Quality control circle | −0.692 | −0.723 | −0.853 |
| Big data assistance | −0.884 | −0.975 | −0.996 |
| $t$ | 1.237 | 2.058 | 6.296 |
| $P$ | 0.003 | 0.006 | 0.008 |



FIGURE 3: Visualization of coupling analysis of inpatient management quality.

TABLE 4: Coupling analysis data of patient prognosis management quality.

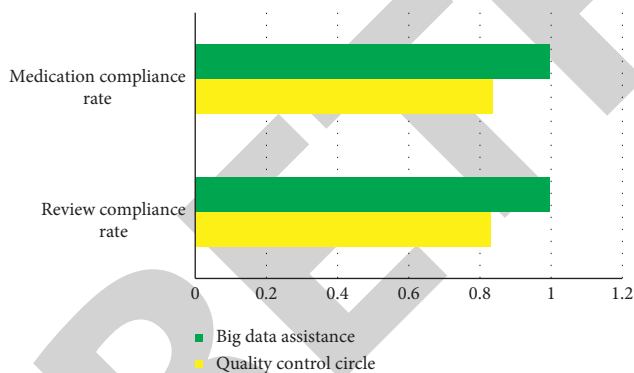| Group | Review compliance rate | Medication compliance rate |
|---|---|---|
| Quality control circle | 0.829 | 0.836 |
| Big data assistance | 0.997 | 0.995 |
| $t$ | 5.302 | 4.298 |
| $P$ | 0.003 | 0.004 |



FIGURE 4: Visualization of coupling analysis of patient prognosis management quality.

In Table 4, through the comparison of the coupling analysis results of patient prognosis management quality under the two different nursing quality evaluation index systems in the above table, it is found that, in the coupling analysis of patient prognosis management quality, the recheck compliance rate of patients using the big data assisted NQEI system is 0.997 and the medication compliance rate is 0.995, indicating that the big data assisted NQEI system has a high correlation with the real data.

In order to more intuitively reflect the comparison results of the coupling analysis of patient prognosis management quality under two different nursing quality evaluation index systems, the data comparison results in Table 4 are visualized, and Figure 4 is obtained.

Figure 4 shows the comparison results of the coupling analysis of patient prognosis management quality under two different nursing quality evaluation index systems. It is considered that the review compliance rate and medication compliance rate under the application of big data are significantly higher than those under the previous application of quality control circle, which can better increase the review compliance rate and medication compliance rate of patients, and are more conducive to the construction of nursing quality evaluation index system.

## 6. Conclusion

Nursing work is an important part of medical treatment, which is closely related to the health interest and life safety of the people. The establishment of nursing quality evaluation index system under the background of intelligent medical treatment can effectively improve and ensure the quality of nursing. The basis for the quality evaluation standard of each link of nursing activities is provided, so that the nursing quality can be greatly improved. Through the technical analysis of big data assisted application, this study analyzes the coupling between nursing satisfaction index and patient hospitalization management quality. It can be seen that the coupling of nursing satisfaction index of the NQEI system assisted by big data is better than that of the NQEI system applied by quality control circle, and the results are credible. The core of smart medicine is "patient-centered," giving patients a comprehensive, professional, and personalized nursing service quality experience. In the context of smart medicine, the construction of nursing quality evaluation index system based on big data assisted analysis provides new ideas for medical nursing and shapes a new medical nursing service model. The data-based and intelligent technology has become an important driving force to comprehensively improve the quality of nursing service. Therefore, the nursing quality evaluation index system under the construction of smart medical big data has promoted the development of the medical and nursing system, effectively improved the overall quality of medical care, and improved the transmission of medical information, which is of practical significance to improve the nursing quality evaluation index system, and plays an important role in the harmonious development of socialism.

## Data Availability

The data underlying the results presented in the study are available within the manuscript.

## Disclosure

The authors confirm that the content of the manuscript has not been published or submitted for publication elsewhere.

## Conflicts of Interest

The authors declare no conflicts of interest.

## Authors' Contributions

All authors have seen the manuscript and approved to submit to your journal.

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