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Retraction

Retracted: TCM Physical Health Management Training and Nursing Effect Evaluation Based on Digital Twin

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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.

In addition, our investigation has also shown that one or more of the following human-subject reporting requirements has not been met in this article: ethical approval by an Institutional Review Board (IRB) committee or equivalent, patient/participant consent to participate, and/or agreement to publish patient/participant details (where relevant).

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] J. Jiang, Q. Li, and F. Yang, "TCM Physical Health Management Training and Nursing Effect Evaluation Based on Digital Twin," *Scientific Programming*, vol. 2022, Article ID 3907481, 13 pages, 2022.

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Research Article

TCM Physical Health Management Training and Nursing Effect Evaluation Based on Digital Twin

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Traditional Chinese medicine (TCM) has been shown to be effective in the treatment of diseases such as malaria, being better understood and accepted by the world. TCM physical health management is based on the policy of "preventive disease," comprehensively collects patients' information, and provides timely and appropriate rehabilitation guidance to achieve the best nursing effect. However, the current TCM physical health management has not been understood by the public, and the effect of its nursing evaluation has not been concluded yet. Therefore, this paper aims to design a TCM physical health management training and learning system based on digital twin technology and to evaluate and analyze the nursing effect. For TCM physical health management training, this paper designed a training system based on the VIKOR algorithm. Based on digital twin technology, the training can be carried out at different times and places, and the teaching content can also be displayed in real time through the cloud platform, which intuitively and comprehensively reflects the teaching content. For the evaluation of nursing effect, this paper selected 100 patients and divided them into two groups to compare the nursing effect of TCM physical health management and general Western medicine nursing. The experimental results of this paper found that the nursing effect of TCM physical health management is 20%–60% better than that of Western medicine nursing in terms of blood pressure, TCM syndromes, exercise tolerance, and quality of life.

1. Introduction

With the rapid development of today's society, people's lives have become colorful. However, everything has two sides, and contradictions always exist. Under such living conditions, the prevalence of the disease has also increased dramatically. With the continuous development of medical level, most of people's diseases can be treated in time. However, illness will affect the quality of life and reduce the happiness index. The concept of "preventive treatment" proposed by the state is to allow people to achieve disease-free prevention and recovery from chronic diseases. This is the advantage of TCM that has been passed down for thousands of years and which is difficult for modern medicine to achieve in a short period of time. Digital twin technology can optimize the training environment and better display the content of TCM physical health management. Therefore, it is necessary to give full play to the advantages of TCM, improve people's awareness of disease prevention, balance medical resources, and improve people's quality of life. It is necessary to work hard in the direction of pre-disease treatment and post-disease rehabilitation, do enough work, and strive to promote the development of medical services. Therefore, the authors combine the health management with the characteristics of TCM and the current advanced digital twin technology and use the TCM physical health management model to intervene and treat patients with chronic diseases, intending to help patients recover while reducing the economic burden and improving the quality of life during the disease process.

TCM has few side effects and pays attention to slow adjustment, which is very different from Western medicine. After the discovery of artemisinin which won the Nobel Prize in Medicine, TCM has become more active in our field of vision, and many scholars have done research on it. Focusing on the promotion and protection of people's health, Xu et al. established a comprehensive evaluation system in line with the characteristics of TCM services. This system can make service management more scientific and standardized [1]. Constantinos et al. discussed the use of Chinese herbal medicines and prescriptions for prevention or treatment during the COVID-19 pandemic in Greece, as well as Chinese herbal medicine supply issues and recommendations for alternatives [2]. Zheng studied the effect of TCM health management on the treatment of anal fistula. He mainly discussed the common symptoms of anal fistula, TCM nursing methods, and health guidance in order to further leverage the advantages of TCM and standardize related nursing management [3]. Through literature mining and analysis, Dai et al. found that TCM has the potential to prevent and treat COVID-19. Then, through network pharmacology studies, it was shown that TCM acts on multiple targets and multiple pathways through multiple components. It exerted antiviral, anti-inflammatory, and immunomodulatory effects in COVID-19 management [4]. Wang and Wang discussed the clinical effect of TCM nursing intervention in the health management of chronic diseases in the community [5]. However, their research payed more attention to the acquisition of active ingredients of TCM but rarely mentioned the nursing effect of TCM physical health management.

Digital twin technology is one of the powerful technologies of Industry 4.0, which is of great significance for industrial automation and remote control. Lee discussed the potential impact of digital twin technology in real-world development and implementation, proposing a unified three-tier blockchain architecture as a guideline for researchers and industry to clearly identify the potential of blockchain [6]. Uhlemann et al. presented practical approaches, requirements, and limitations of multimodal data acquisition methods. A further concept of digital twins for production processes is able to combine production systems with their digital equivalents as a basis for optimization. It can minimize delays between data acquisition time and digital twin creation [7]. Alam and El Saddik proposed a digital twin architecture reference model, C2PS, for cloud-based cyber-physical systems [8]. Qi and Tao explored big data and digital twins in manufacturing, including their concepts and their applications in product design, production planning, manufacturing, and predictive maintenance [9]. Li et al. implemented digital twin vision by constructing a general probabilistic model for diagnosis and prognosis using the concept of dynamic Bayesian networks and illustrated the proposed method with an example of fatigue crack growth in an aircraft wing [10]. However, few of their studies involve the combination of TCM and digital twin technology.

The innovations of this paper are as follows: This paper used digital twin technology to provide an online training system for TCM physical health management training and provide technical support for TCM training in a visual and intuitive way. The nursing effect of TCM physical health management took Baduanjin, Taijiquan, Qishengui, ginger, and mutton soup as the rehabilitation therapy, combined with online education, smoking cessation tips, and other auxiliary methods. Applying Internet+ to patients' lives better, observe their blood pressure, heart rate, and BMI; evaluate their quality of life, efficacy of TCM syndromes, and readmission rate; and explore the role and feasibility of TCM health management model in the process of rehabilitation of chronic disease patients. Then, the TCM health management prescription was synthesized to explore the feasibility of TCM physical health management model in the rehabilitation process of chronic disease patients.

2. TCM Physical Health Management

2.1. Chinese Medicine Treatment. Nowadays, people's lives have undergone earth-shaking changes, but their health awareness is not high enough. In terms of diet, people are addicted to eating fat and sweet. Lack of physical activity in life has led to a significant increase in the prevalence of "wealthy diseases," such as coronary heart disease, hypertension, and diabetes, in recent years [11]. With the development of medical level, it is difficult for these diseases to directly take the patient's life, but over time, they would evolve into more serious diseases. Heart failure is a dead end for all kinds of heart diseases, and it is a very serious organic heart disease. Chronic heart failure is mainly caused by narrowing and blockage of the lumen of the coronary arteries due to various causes, resulting in inadequate blood supply to the heart muscle, damage to the heart muscle caused by various heart diseases. Then, the structure and function of the heart are reduced, and the syndrome of heart failure appears. Heart failure patients are more common in the elderly, and most of their illnesses are protracted and difficult to recover. At the same time, they must regularly take anti-platelet aggregation, cardiotonic, plaque-stabilizing, diuretic, and anti-myocardial remodeling drugs for maintenance. Over time, the disease causes huge economic burden. Nondrug treatment has higher risks and more unbearable costs, which not only puts patients under the pressure of physical discomfort, but also imposes an economic burden, causing patients and their families to have huge mental pressure. Not only does the quality of life of the patients drop sharply, but also the family happiness index is seriously affected. At the same time, the incidence of cardiovascular events, rehospitalization rate, and mortality remain high, which seriously endangers human health and affects social development [12, 13]. In recent years, the status of TCM has gradually improved, and the research on combined treatment of heart failure with traditional Chinese and Western medicine has also increased year by year, as shown in Figure 1.

Nowadays, the big health environment is a hot topic in China. With the development of the national economy, people's demand for health has gradually increased. People understand that without health, everything is zero. However, the current level of people's medical knowledge is not high enough, and the awareness of healthy living habits is not strong enough.

With the gradual implementation of national strategies such as "Healthy China," "Preventive Treatment of Diseases," and "Internet Plus," the research on Internet Plus health management model has gradually deepened. People's health level has gradually improved, and the rehabilitation

Figure 1: TCM nursing.

treatment after discharge from hospital has been well controlled. At the same time, in the information age, people's lives are closely related to the Internet, so it is obviously more in line with the characteristics of the times to use the TCM physical health management model to treat patients [14, 15]. It is not only the need of the development of the times, but also a necessary process to adapt to the development of the times. The state has invested heavily in healthcare and attaches great importance to the cause of people's "big health," so it is necessary to respond to the call of the state and give full play to imagination and creativity. While learning the skills of Chinese medicine well, people must adapt themselves and what they have learned to the development and the needs of the times.

2.2. Digital Twin Control Strategy. As shown in Figure 2, the process from the physical world to the digital world is a digital twin. The digital twin technology can transform the real model interactively into a virtual digital model through the Internet and cloud computing technology.

VIKOR algorithm is a classic multi-index compromise solution decision-making method that can effectively solve the conflict between multiple criteria and finally obtain a compromise solution. It constructs a decision matrix D with dimension (I, n), as shown in (1), where I represents the number of control services RCaaS and n represents a user-defined number [15].

$$D = \begin{pmatrix} d_{11} & \cdots & d_{1n} \\ \vdots & \ddots & \vdots \\ d_{I1} & \cdots & d_{In} \end{pmatrix}. \tag{1}$$

Among them, d_{ij} represents the attribute of the i-th candidate service A_i under the j-th indicator c_j.

Specific steps are as follows:

The RCaaS index system is standardized by the linear maximum and minimum normalization method [16]. When the j-th index is a benefit index, the normalization process is shown in the following formula:

$$f_{ij} = \frac{d_{ij} - d_j^{\min}}{d_j^{\max} - d_j^{\min}}. \tag{2}$$

When the j-th index is a cost index, the normalization process is shown in the following formula:

$$f_{ij} = \frac{d_j^{\max} - d_{ij}}{d_j^{\max} - d_j^{\min}}. \tag{3}$$

Among them, f_{ij} is the standard value after normalization of d_{ij}; $d_j^{\max}$ is the maximum value among the attribute values of all candidate services A under the j-th index; $d_j^{\min}$ is the minimum value among the attribute values of all the candidate services A under the j-th index [17, 18]; $j = 1, 2, \ldots, n$; and $i = 1, 2, \ldots, I$.

S_i and R_i are calculated by the following formulas:

$$S_i = \sum_{j=1}^{n} w_j f_{ij}, \tag{4}$$

$$R_i = \max \left\{ w_i f_{ij} \right\}. \tag{5}$$

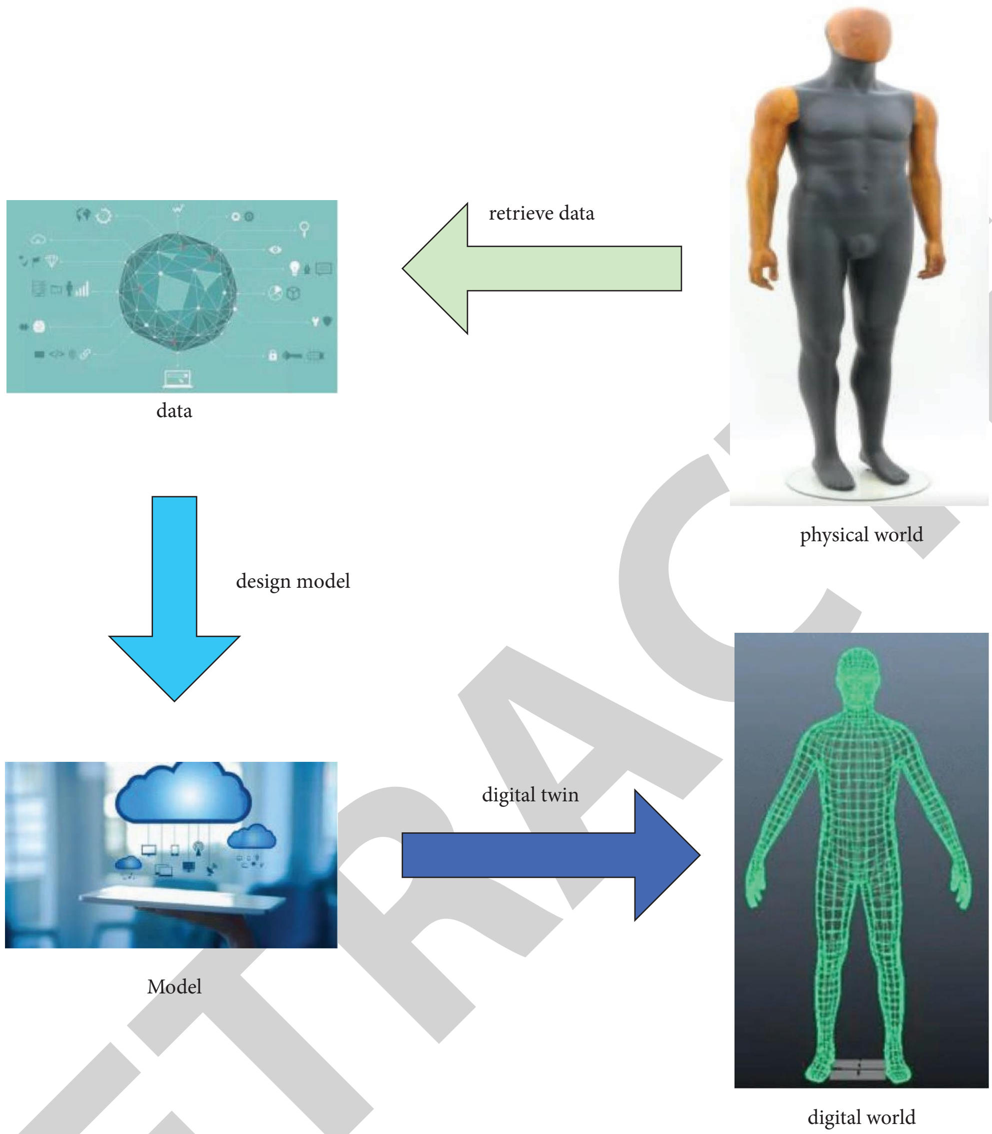

Figure 2: Digital twin model.

Among them, w_j is the weight of index j obtained by FBWM; S_i is the weighted sum of the i-th candidate service under all indexes; R_i is the maximum value among all weights f_{ij}; and $i = 1, 2, \ldots, I$.

$S^*, S^-, R^*,$ and R^- are calculated according to the following formula:

$$S^* = \min S_i; S^- = \max S_i; R^* = \min R_i; R^- = \max R_i, \quad (6)$$

where S^* is the maximum group utility value; R^* is the minimum individual regret value; and S^-, R^- are the opposite.

The value of Q_i is calculated according to the following formula, where $i = 1, 2, \ldots, I$.

$$Q_i = \frac{v(S_i - S^*)}{S^- - S^*} + \frac{(1 - v)(R_i - R^*)}{R^- - R^*}. \quad (7)$$

Among them, Q_i is the final compromise solution closest to the ideal solution, v is the weight of the largest group utility, and (1-v) is the weight of the smallest individual regret. When $v > 0.5$, the maximum group utility strategy is adopted. When $v < 0.5$, the voting preference strategy is adopted. When $v = 0.5$, the consensus strategy is adopted, and usually v is 0.5 [19].

According to the values of Q_i, S_i, and R_i, all RCaaS are sorted in descending order.

The optimal RCaaS is chosen according to Q_i, which has the smallest deviation measure from the ideal solution.

Taking the candidate service with the largest Q_i value as the compromise solution closest to the ideal value requires the following two conditions:

The first one is the acceptability advantage; namely,

$$Q(A^{(1)}) - Q(A^{(2)}) < DQ, \quad (8)$$

where $A^{(1)}, A^{(2)}$ are the RCaaS in the first and second positions after sorting according to Q_i, and DQ is given by the following formula:

$$DQ = \frac{1}{I-1}. \tag{9}$$

The second condition is the stability of acceptability. That is, the candidate service $A^{(1)}$ selected according to Q_i must be in the first sequence number position obtained according to the order of S or R at the same time, indicating that the compromise solution is stable in the decision-making process.

In order to avoid inconsistencies among the evaluation indicators established above and, at the same time, consider the multi-indicator decision-making requirements of qualitative services in a fuzzy context, this paper adopted the VIKOR algorithm improved by introducing FT and TFN, namely, FVIKOR-TFN, to optimize RCaaS. The specific steps are as follows:

A decision matrix $[f_{ij}]_{I\times n}$ is constructed by standardizing the attribute values of each control service represented by the TFN. For benefit-type attribute j, the normalization process is shown in the following formula:

$$f_{ij} = \left(f_{ij}^L, f_{ij}^M, f_{ij}^U\right). \tag{10}$$

For cost-type attribute j, the normalization process is shown in the following formula:

$$f_{ij} = \left(f_{ij}^L, f_{ij}^M, f_{ij}^U\right) = \left(\frac{a_{ij}^{L-}}{a_{ij}^U}, \frac{a_{ij}^{M-}}{a_{ij}^M}, \frac{a_{ij}^{U-}}{a_{ij}^L}\wedge 1\right). \tag{11}$$

Among them,

$$a_{ij}^{L+} = \max\left\{a_{ij}^L, \forall i, j\right\}; a_{ij}^{L-} = \min\left\{a_{ij}^L, \forall i, j\right\}, \tag{12}$$

where $\wedge 1$ means small operation to ensure that the upper bound of TFN after normalization does not exceed 1.

The positive and negative ideal solutions of each attribute are determined by the following formula:

$$f_{ij}^+ = \max{}_i f_{ij}^U, \forall j, f_{ij}^- = \min{}_i f_{ij}^L, \forall j. \tag{13}$$

Group utility value and individual regret value are calculated in the form of TFN.

$$S_i^L = \sum_{j=1}^n w_j \left(\frac{f_j^+ - f_j^U}{f_j^+ - f_j^-}\right)\forall i,$$

$$S_i^M = \sum_{j=1}^n w_j \left(\frac{f_j^+ - f_j^M}{f_j^+ - f_j^-}\right)\forall i, \tag{14}$$

$$S_i^U = \sum_{j=1}^n w_j \left(\frac{f_j^+ - f_j^L}{f_j^+ - f_j^-}\right)\forall i.$$

In order to analyze the influence of decision-makers' subjective risk awareness on the optimal results of control services, the probability formula of TFN is introduced. The comparison probability p_{ij} between Q_i is calculated to establish the probability matrix p, and the final evaluation reference value r_i is calculated according to the following formula:

$$r_i = \frac{1}{m(m-1)}\left(\sum_{j=1}^m p_{ij} + \frac{m}{2} - 1\right)\forall i. \tag{15}$$

The RCaaS is sorted in ascending order according to r_i; the smaller the r_i and the larger the Q_i, the better the candidate service [20].

2.3. Algorithm Performance. First, the performance of the FVIKOR algorithm itself is verified; then, the analysis is made from three aspects: the evaluation parameters of the decision-making results, the influence of the decision-maker's risk attitude on the optimal results, and the influence of the qualitative and quantitative index weighting coefficients on the optimal results. According to the description of the formula, S, R, and Q are three evaluation parameters to measure the acceptability of FVIKOR decision results [21]. As shown in Figure 3, A10 with the largest Q value should be selected as the optimal service and transmitted to the RDB and digital models on the local server. For acceptability stability, since A10 ranks first according to the size of R, this means that A10 can be accepted as the best RCaaS with strong stability.

Four services are selected from Figure 3. The fixed decision-making mechanism coefficient v is 0.5. The decision-maker's subjective risk awareness τ is set as 0, 0.1,..., 1, and then the impact of τ on the RCaaS decision-making results is explored, as shown in Figure 4. As shown in Figure 4(a), when τ gradually increases, that is, when the decision-maker's attitude changes from aversion to risk-seeking, the r values of A1 and A3 gradually increase, and the service performance gradually deteriorates. However, A2 and A4 gradually decline, and the performance gradually becomes better. This shows that A1 and A3 tend to be chosen by risk-averse decision-makers, while A2 and A4 tend to be chosen by risk-seeking decision-makers. From a vertical perspective, no matter what the risk attitude of decision-makers is, there is always A3<A2<A4<A1; that is, A3 has the best performance and A1 has the worst performance and has strong stability. After adjusting the service parameters, the curve has an intersection, indicating that the risk attitude will affect the final decision result, as shown in Figure 4(b).

3. TCM Physical Health Management Training System Based on Digital Twin

Based on the DTICR control framework and ICR digital twin control strategy proposed in this paper, this section implemented the ICR digital twin control service system. Through the design and implementation of each functional module and the overall system, the remote monitoring of ICR status, cloud layer, and local two-level ontology service storage management are realized. The four links of RCaaS optimization, analysis, model control, and entity control are connected to verify the important role of digital twin technology in connecting cloud services and TCM health management training.

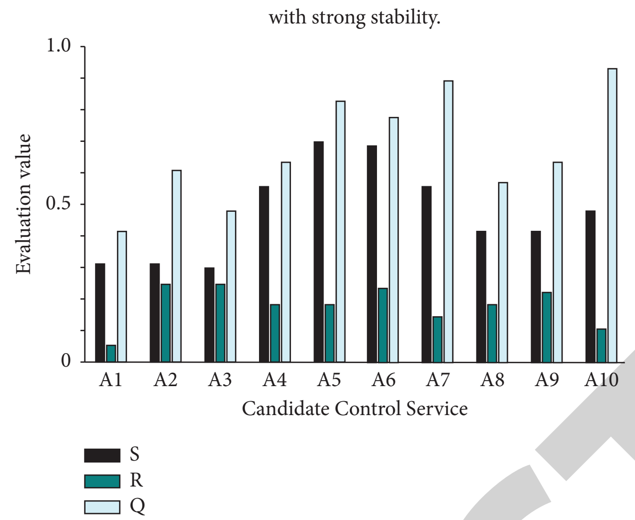

Figure 3: FVIKOR decision result and its evaluation parameters.

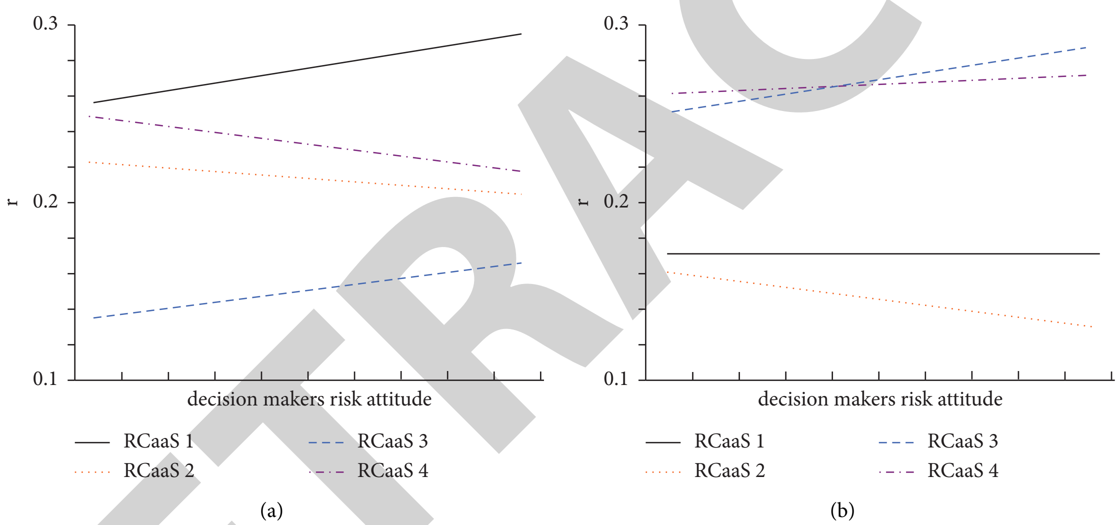

Figure 4: Influence of risk attitude τ on optimal results.

3.1. System Architecture Framework. The ICR control service system integrates and verifies the virtual-real interaction mechanism and dynamic operation mechanism of the DTICR framework, as well as the RCaaS optimization and analysis in the digital twin control strategy. The framework structure of the system is shown in Figure 5. The system covers five modules. The cloud service management module processes control requests, running decision-making algorithms, and issues RCaaS. The remote communication module connects the cloud service layer and the local service layer and completes the service-to-command parsing. The digital model control module realizes the operation in the virtual space. The virtual-real interaction module connects both virtual and real ends through attribute customization and IO port mapping. The physical entity control module receives the joint angle transmitted by the model; follows the movement; and finally realizes the real-time synchronization of the model and the entity, and the connection between the cloud service and the underlying control [22].

3.2. System Development and Operating Environment. The system adopts WorkVisual 4.0 to configure and debug the twin model. Through Siemens' TIA Portal V13 SP1 and Automation License Manager 5.3 SP3, the hardware configuration, software configuration, and network configuration of the robot are completed, managing PLC variables that reflect the robot state and binding model attributes. The X2OPC1.0 server converts Modbus, BACnet, and other communication protocols into OPC and connects the underlying PLC and the upper-level MES scheduling system to ensure that MES can acquire robot status sensing data and manage the process of robots completing manufacturing tasks. The Demo3D 2015 digital simulation platform is the main environment for realizing the robot model control module. It has the characteristics of high-fidelity model appearance and animation design, PLC external equipment integration, and secondary function development. The database software SQL Server 2008 is used to manage various data types generated by industrial robot entities and models

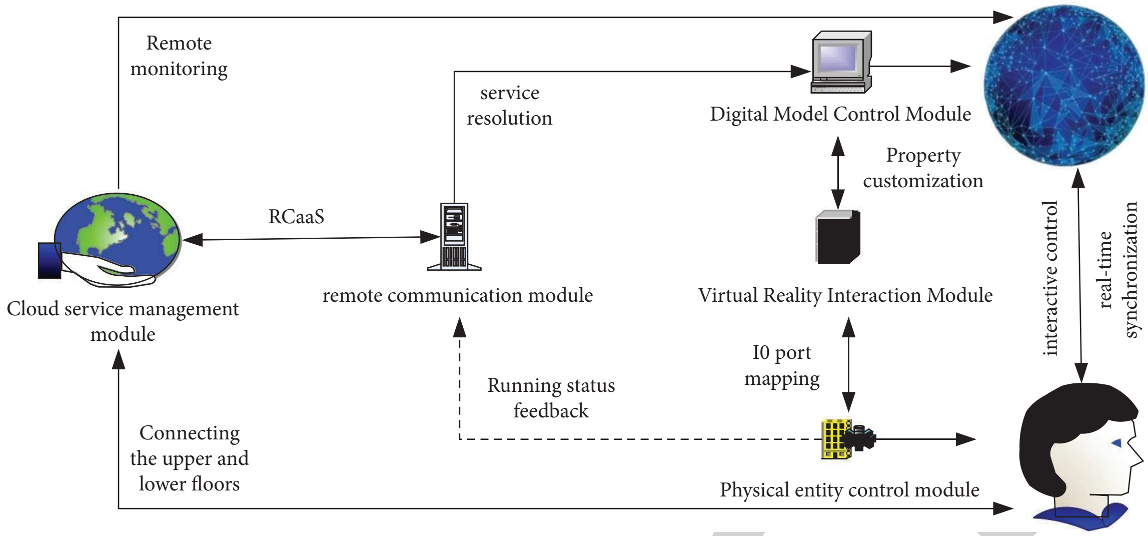

Figure 5: Overall framework of digital twin real-time training service system.

and the derived digital twin data. HBase and MySQL are used to manage cloud and local control service information, respectively. MyEclipse 2016 is used to implement the remote communication module and process RCaaS ontology data information in conjunction with Jena. In addition, there are some auxiliary development tools, such as Navicat and Tomcat. All the above software runs on the 64-bit Windows 10 operating system.

3.3. System Development Key Technology. The key technologies used to realize the system include three aspects: digital twin-related technology to realize real-time interactive control of ICR information space and physical space, ontology technology to describe control services, and a web visualization technology that integrates various modules and provides human-computer interaction and remote monitoring functions.

The digital twin technologies used include "machine-object-environment" interconnection technologies in physical space, such as distributed collaborative control of heterogeneous resources, resource status awareness access (such as distributed RFID and smart meters), and multi-source data encapsulation [23, 24]; virtual robot modeling and operation simulation technology, such as "element-behavior-rule" multidimensional modeling, model fusion, and model operation simulation and verification; digital twin ICR operation technology, such as real-time interaction and control of virtual and real space; and twin data management technologies, such as virtual-real bidirectional mapping and data-structured cluster storage [25].

This system uses SSH (struts + spring + hibernate) integrated framework to develop web applications. It is based on MVC (model-view-controller) design pattern to separate front-end page display and back-end business logic. As a controller, struts handles data interaction between the model layer and the view layer. Spring manages the application life cycle and component configuration through IoC (Inversion of Control) and AOP (Aspect Oriented Programming). Hibernate is responsible for encapsulating JDBC into lightweight objects, operating databases, mapping relationships between objects, and preserving data.

3.4. Remote Communication Module. The remote communication module is responsible for establishing the connection and information transmission between the cloud service layer and the local, HBase, and MySQL. The detailed design block diagram is shown in Figure 6.

The Hadoop cluster is deployed on the cloud server, and then HBase database and tables to store RCaaS and basic ontology information with different functions and evaluation indicators are established. After the Hadoop cluster is successfully started, four files, namenode, datanode, resourcemanager, and nodemanager, are created. Namenode is used to manage the namespace of the file system and maintain the metadata of the files (folders). Datanode stores/retrieves data and feeds back data block information to namenode. The resourcemanager centrally manages and schedules the resources in the cluster. The nodemanager acts as the server agent of the resourcemanager, monitoring and reporting the usage details of the resources.

3.5. Virtual Reality Interaction Module. The virtual-real interaction module is used to connect information and physical space to complete the two-way data communication and interaction between virtual and reality, including the binding of PLC variables and transition variables and the mapping of transition variables and model attributes. In TIA Portal software, the PLC variables (%ID, %QD) flowing in/out in one direction (%ID, %QD) and the transition variables (%MD) in two-way flow are associated with the ADD logic element to complete the variable value reading in virtual control and real mode and the variable value writing operation in real control and virtual mode.

The built-in Tag Browser interface of Demo3D can connect physical robots and digital models. By selecting the protocol, bus, hardware adapter, and PLC type on the

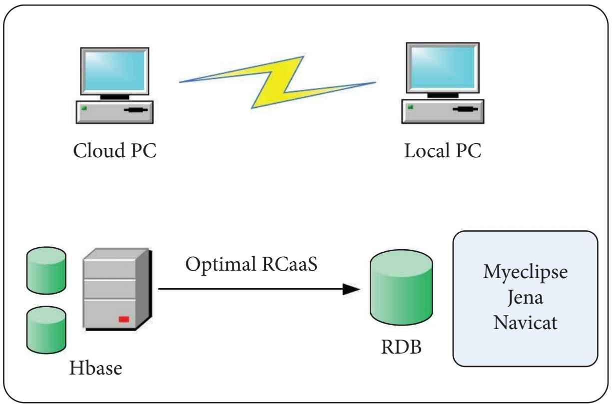

Figure 6: Design of remote communication module.

Add Server pop-up window, the server that needs to be connected is added. By entering the server name, host port, and connection status in the left menu bar and adding the PLC variable address, variable name, data communication method, and mapped model properties on the right, when the virtual and real ends establish data communication, the robot joint angle value is displayed in the figure in real time.

4. Nursing Effect of TCM Physical Health Management

4.1. Experimental Design. According to the following inclusion criteria, 100 patients were selected for investigation.

Qi deficiency: being prone to fatigue; fatigue; shortness of breath; pale red tongue, fat and tender tongue, or tooth marks on the edge of the tongue; deep and thin pulse. Blood stasis: chest pain with fixed position, needle-like pain, dark tongue, or petechiae and ecchymosis. Secondary symptoms: easily getting tired of activities, being too tired and lazy to speak, spontaneous sweating, weak speech, pale or dark purple face and lips.

Efficacy criteria:

Point evaluation of TCM symptom score scale: n (efficacy index) = (points at discharge − points after discharge treatment)/points at discharge × 100%.

Recovery: the symptom score is reduced compared with that before the application of the TCM health management model, 90%≤n.

Significantly effective: compared with that before the application of the TCM health management model, the symptom score is reduced, 70%≤n<90%.

Effective: compared with the TCM health management model, the symptom score is reduced, 30%≤n<70%.

Invalid: compared with the TCM health management model, the symptom score is reduced, n<30%.

Minnesota Heart Failure Quality of Life Efficacy Evaluation Criteria: scale score evaluation: n (efficacy index) = (score at discharge − score after discharge treatment)/score at discharge × 100%.

Recovery: the symptom score is reduced compared with that before the application of the TCM health management model, $90\% \leq n$.

Significantly effective: compared with the TCM health management model, the symptom score is reduced, $70\% \leq n < 90\%$.

Effective: compared with the TCM health management model, the symptom score is reduced, $30\% \leq n < 70\%$.

Invalid: compared with the TCM health management model, the symptom score is reduced, $n < 30\%$.

The control group was compared with the experimental group of TCM health management mode using the standardized discharge treatment of Western medicine.

4.2. Experiment Results

4.2.1. General Comparison. A total of 100 cases were included in this trial. There were 24 males in the experimental group, accounting for 48%, and 26 females, accounting for 52%. The control group included 25 males, accounting for 50%, and 25 females, accounting for 50%. The details are shown in Table 1.

In terms of age of patients in the two groups, the average age of the control group was 61.29 ± 10.34, and the average age of the experimental group was 59.29 ± 10.51. After age stratification, there were 5 people aged 30–45, 12 people aged 46–55, 18 people aged 56–65, and 15 people aged 66–75 in the control group. In the experimental group, there were 5 persons aged 30–45, 13 persons aged 46–55, 20 persons aged 56–65, and 12 persons aged 66–75. The details are shown in Table 2. After testing by t, $P = 0.430 > 0.05$, the age comparison results showed that there is no statistical difference between groups.

The comparison of the condition before and after treatment is shown in Table 3.

As shown in Table 3, the heart rate and BMI of the two groups before treatment were compared: the heart rate and BMI of the two groups before treatment conformed to normal distribution. The independent samples t-test showed that $P = 0.738$, $0.630 > 0.05$; there was no difference; and there was comparative significance.

Comparison of heart rate and BMI between the two groups after treatment showed that the heart rate and BMI of the control group were in line with normal distribution. After pairing t, the test showed that $P = 0.356$, $0.575 > 0.05$ and there was no difference, indicating that the traditional discharge treatment in the control group had no clear effect on heart rate and BMI. The heart rate and BMI of the experimental group were in line with the normal distribution, and the paired t-test showed that $P = 0.069$, $0.202 > 0.05$ and there was no difference, indicating that the intervention method of the experimental group had no clear effect on the heart rate and BMI.

Comparison of heart rate and BMI between the two groups after treatment showed that the heart rate and BMI of the two groups were in line with the normal distribution. After testing by the independent samples t, it showed that

Table 1: Comparison of gender between the two groups (unit: person).

	Test group	Control group
Number of cases	50	50
Male	24	25
Female	26	25

Table 2: Age comparison between the two groups.

Age group (years)	Test group	Control group
30–45	5	5
46–55	13	12
56–65	20	18
66–75	12	15

Table 3: Comparison of heart rate and BMI before and after treatment.

Index	Group	Before treatment	After treatment
Heart rate	Test group	80.58 ± 15.87	79.32 ± 10.24
	Control group	81.43 ± 17.17	81.98 ± 15.23
BMI	Test group	24.54 ± 2.97	24.63 ± 2.88
	Control group	24.14 ± 2.13	24.17 ± 2.08

$P = 0.333$, $0.637 > 0.05$ and there was no difference, indicating that there is no difference between the two groups in terms of heart rate and BMI.

As shown in Table 4, the comparison of the two groups before treatment showed that the blood pressure of the two groups conforms to the normal distribution. The independent samples t-test showed that $P = 0.398$, $0.078 > 0.05$; the difference is not statistically significant; and it is comparable.

Comparison between the two groups after treatment showed that the systolic blood pressure and diastolic blood pressure in the control group were in line with the normal distribution, and the paired t-test showed that $P = 0.043$, $0.034 < 0.05$ and the difference was statistically significant, indicating that the conventional discharge treatment of the control group was effective in treating blood pressure. The systolic blood pressure and diastolic blood pressure in the experimental group after treatment were in line with the normal distribution; $P \le 0.001$, $0.004 < 0.05$ were obtained by the paired t-test of the intragroup comparison; and there were significant differences, indicating that the intervention program of the TCM experimental group was effective in the treatment of blood pressure.

The comparison of TCM syndrome scores is shown in Figure 7.

As shown in Figure 7, the four main syndromes of the two groups of patients did not conform to the normal distribution before treatment. After the independent sample test, the P values were calculated as 0.549, 0.712, 0.612, and 0.855, all of which were greater than 0.05, indicating that they were indistinguishable and comparable.

Intragroup comparison of the main symptoms of TCM in the two groups after treatment is shown in Figure 7(a). The scores of each symptom in the control group after treatment did not conform to the normal distribution, and paired rank sum test showed that $P \le 0.001$, 0.001, $0.001 < 0.01$ except for shortness of breath $P = 0.5805 > 0.05$. There are differences, indicating that the traditional discharge treatment has poor improvement effect on shortness of breath symptoms and the improvement effect of other main symptoms is good. As shown in Figure 7(b), the symptom scores of the experimental group did not conform to the normal distribution after treatment, and the paired rank sum test showed that the main symptoms had $P = \le 0.001$, 0.001, 0.011, $0.001 < 0.05$. There are differences, indicating that TCM health management has a good effect on improving the main symptoms of TCM in patients.

Comparison between the two groups of patients in terms of the main symptoms of TCM after treatment showed that the scores of each symptom in the two groups did not conform to the normal distribution. The independent sample rank sum test showed that the symptoms of chest tightness, dizziness, and shortness of breath were $P = 0.005$, 0.026, $0.008 < 0.05$, and there are significant differences. Palpitation symptoms showed $P = 0.124 > 0.05$ with no difference, indicating that Chinese medicine health management is superior to traditional discharge treatment in the treatment of main symptoms of Chinese medicine, except for palpitations.

As shown in Figure 8, $P = 0.779$, 0.712, 0.283, 0.259, 0.084, 0.189, 0.926, 0.906, $0.546 > 0.05$ for each secondary syndrome in the two groups before treatment. There is no significant difference and comparable.

In the control group, weight $P = 0.564 > 0.05$, shortness of breath$P = 0.218 > 0.05$, pulse$P = 0.083 > 0.05$, abdominal distension, mouth stickiness, fatigue, tongue body, tongue quality, tongue coating $P = 0.001$, 0.001, 0.027, 0.014, 0.046, $0.025 < 0.05$, there are significant differences. These data showed that the traditional discharge treatment has a good effect on the secondary symptoms except for body weight, shortness of breath, low voice, and pulse condition. Although the other symptoms are improved, this is not statistically significant.

As shown in Figure 8(b), the body weight of the test group $= 0.317 > 0.05$; from the abdominal distention, stickiness in the mouth, fatigue, shortness of breath, low voice, tongue body, tongue quality, tongue coating, and pulse condition, the details are obtained: $P \le 0.001$, 0.001, 0.001, 0.001, 0.008, 0.005, 0.008, $0.001 < 0.05$, indicating that the TCM physical health management model has a good effect on improving secondary TCM syndromes except for body weight.

Comparison of the secondary syndromes between the two groups after treatment showed that, compared with the control group, the experimental group has significant differences in three aspects: sticky mouth, fatigue, and shortness of breath: $P = 0.023$, 0.001, $0.001 < 0.05$. There was no significant difference in abdominal distension, tongue body, tongue quality, tongue coating, and pulse condition: $P = 0.844$, 0.074, 0.106, 0.247, 0.666, $0.082 > 0.05$.

The comparison of the total scores between the two groups before treatment is shown in Table 5: the scores of

Table 4: Comparison of systolic blood pressure and diastolic blood pressure before and after treatment in the two groups of patients.

Index	Group	Before treatment	After treatment
Systolic blood pressure	Test group	133.43 ± 20.89	123.96 ± 11.65
	Control group	137.83 ± 21.04	134.82 ± 15.22
Diastolic blood pressure	Test group	84.84 ± 10.39	74.18 ± 5.19
	Control group	87.34 ± 12.18	82.17 ± 15.31

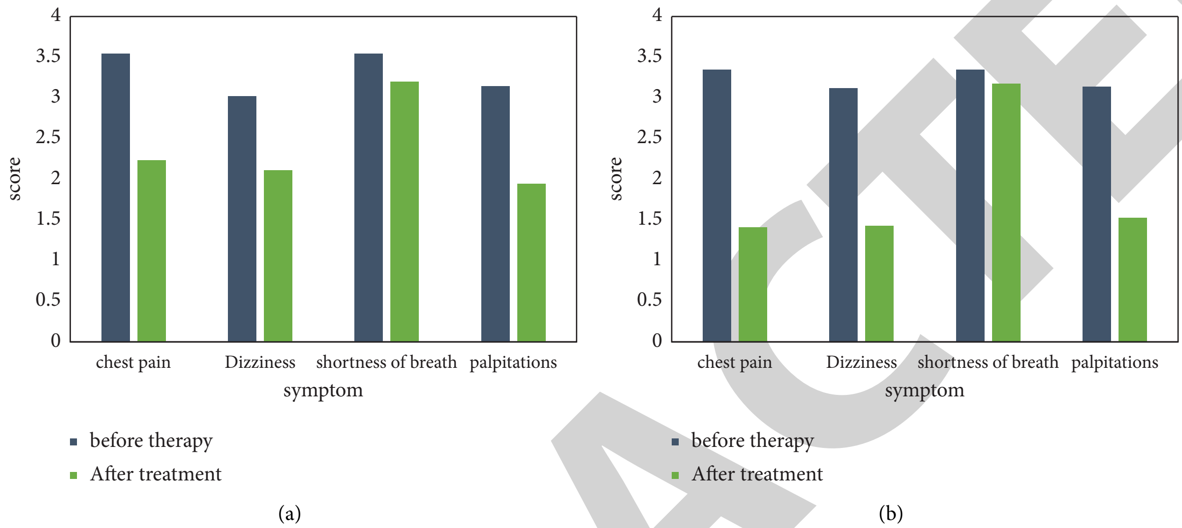

Figure 7: Comparison of the main TCM symptoms between the two groups. (a) Comparison of symptoms in the control group before and after treatment. (b) Comparison of symptoms in the experimental group before and after treatment.

TCM syndromes in the two groups conformed to the normal distribution, and the single-sample t-test showed that$P = 0.974 > 0.05$; there was no difference that could be compared.

Intragroup comparison of the total scores of the two groups after treatment showed that the scores of the two groups of patients did not conform to the normal distribution, the control group obtained $P = 0.001 < 0.05$ by the paired rank sum test, and there was a significant difference, indicating that the traditional discharge treatment had obvious therapeutic effect on the TCM syndromes score of patients and it has statistical significance. The experimental group showed $P = 0.001 < 0.05$, with a significant difference, indicating that the TCM health management model has excellent therapeutic effect on TCM syndromes. The total effective rate was 88.24% according to the evaluation of TCM syndrome.

Comparison of the total scores between the two groups after treatment showed that, after the rank sum test, $P = 0.001 < 0.05$ and the total effective rate was 88.24% according to the evaluation of the efficacy of TCM syndrome score, indicating that TCM health management has obvious advantages over traditional hospital discharge treatment in TCM syndromes.

As seen in Figure 9, (a) represents the comparison of the control group's MLHFQ score before and after treatment, and (b) represents the comparison of the experimental group's MLHFQ score before and after treatment. Comparison of the two groups' pretreatment MLHFQ scores showed that, before treatment, the two groups' physical, emotional, and other ratings all fell within the usual distribution. There is no statistical difference or comparability according to the independent samples t-test: $P = 0.319$, 0.615, and $0.442 > 0.05$.

Comparison of MLHFQ scores in the two groups after treatment is shown in Figure 9(a). The rank sum test of the patients in the control group showed that the three dimensions were $P = 0.001$, 0.005, $0.001 < 0.05$ and there were statistical differences, indicating that the traditional discharge treatment has a good effect on the improvement of the three dimensions. As shown in Figure 9(b), after the treatment, the test group showed that $P = 0.001 < 0.01$ by the rank sum test, and there was a very significant difference, indicating that the test group could significantly improve the quality of life of patients with heart failure in all aspects.

4.3. Feasibility and Result of TCM Health Management Model

4.3.1. The Effect of TCM Health Management Mode on Heart Rate and BMI. The t-test showed that $P > 0.05$. The difference was not statistically significant, and it was comparable. However, after the treatment, the heart rate of the two groups was compared. After testing t, $P > 0.05$, and the difference was not statistically significant, indicating that there was no significant difference in heart rate between the two groups before. There was also no significant difference

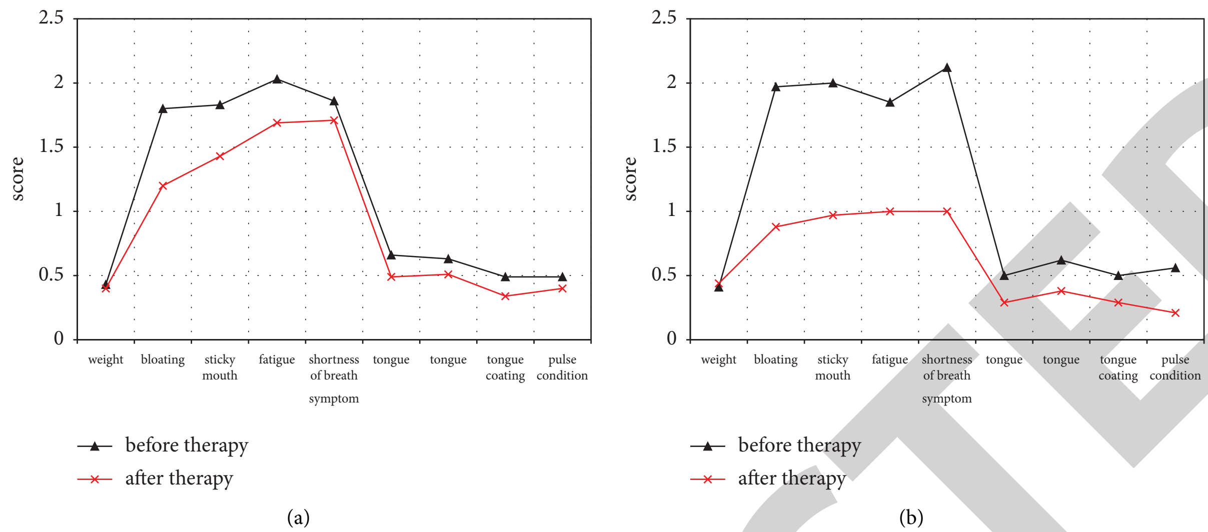

FIGURE 8: Comparison of secondary TCM symptoms between the two groups. (a) Comparison of symptoms in the control group before and after treatment. (b) Comparison of symptoms in the experimental group before and after treatment.

between the two groups after treatment, indicating that the treatment effect was not obvious. The reason for this result is that, through observation data, it is found that the heart rates of the two groups of patients were mostly in the normal range before treatment, because the data collected were all the data when the patients were discharged from the hospital. During hospitalization, most of the patients' heart rates have been effectively controlled by inpatient treatment. After discharge, the heart rate control of the two groups was satisfactory, so there was no significant difference.

High BMI is an important risk factor for chronic heart failure in elderly patients with coronary heart disease. A prospective study found that with increasing BMI, the risk of developing heart failure also increased. However, too low BMI also has a negative impact on the long-term prognosis of chronic heart failure. The comparison between the two groups and after treatment, after testing by t, is $P > 0.05$, indicating that the TCM health management model and traditional discharge treatment have stable weight control of patients.

4.3.2. The Effect of TCM Health Management Model on Blood Pressure. The 6-minute walk test has the characteristics of simple operation, low cost, and good safety. It is an important indicator for evaluating exercise tolerance in patients with chronic diseases, with certain reliability and repeatability. Compared with complex instruments, it does not require higher exercise intensity and is closer to the patient's usual exercise tolerance, which can provide very valuable information on the patient's cardiac function, treatment effect, and prognosis. Therefore, the standard for evaluating exercise tolerance in this test is the 6-minute walk test. After statistical analysis, the traditional discharge treatment in the control group had a certain change in the 6-minute walking test distance of the patients after treatment, with $P < 0.05$. The TCM health management model in the experimental group was significantly changed after treatment compared with before treatment, with $P < 0.05$. The comparison between the groups showed that the difference between the two groups after treatment was significant, with $P < 0.05$, indicating that TCM health management has a good effect on improving exercise tolerance in patients with chronic diseases.

TABLE 5: Comparison of the total score of TCM syndromes between the two groups.

	Test group	Control group
Number of cases	50	50
Before treatment	23.46 ± 5.37	23.69 ± 5.46
After treatment	12.16 ± 4.13	17.17 ± 5.13

4.3.3. Influence of TCM Health Management Model on TCM Syndromes. In the main symptom score, the symptom of shortness of breath after treatment showed $P > 0.05$, and the effect was not good. In terms of secondary syndromes, although both groups have improved, the comparison between the two groups after treatment revealed that only the three aspects of stickiness in the mouth, fatigue, and shortness of breath were better than those in the control group. This indicated that although the traditional discharge treatment can also improve the symptoms of chest tightness, dizziness, and palpitations, the improvement of other symptoms and overall scores is inferior to that of the TCM health management model. Similar studies have proved that the combination of Qi and Huoxue therapy with TCM healthcare methods can reduce the score of TCM syndromes and improve the patient's condition.

4.3.4. Influence of TCM Health Management Model on Quality of Life. The Minnesota Heart Failure Quality of Life Scale is the earliest and most widely used international standard for evaluating the quality of life of patients with heart failure. It contains the patient's self-cognition of the body, symptoms, psychological emotions, social

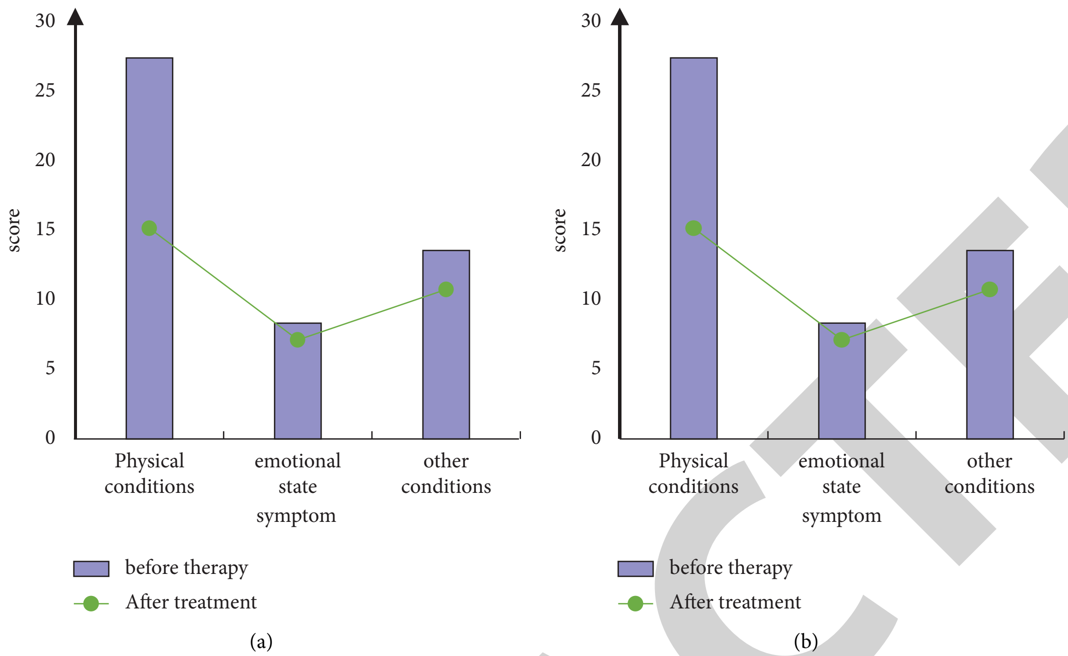

Figure 9: Comparison of MLHFQ scores before and after treatment in the two groups.

economy, and other aspects, which can be as close as possible to the patient's real life situation. This paper used the Minnesota Heart Failure Quality of Life Scale to evaluate the quality of life of the patients after the experiment. In the control group, $P < 0.05$ was obtained in all three dimensions, indicating that the traditional discharge treatment had a good effect on improving the quality of life. The comparison of physical, emotional, and other conditions in the experimental group before and after treatment showed that $P < 0.01$ with very significant difference. $P < 0.01$ was obtained for comparison between groups. The effective rate of the physical condition of the test group was 76.47%, and the markedly effective rate was 17.65%. The effective rate of emotional situation was 67.65%, and the marked rate was 14.71%. In other conditions, the effective rate was 67.65%, the marked rate was 14.71%, and the comprehensive effective rate was 91.18%. The effective rate of the control group's physical condition was 77.14%, and the markedly effective rate was 5.71%. The effective rate of emotional state was 37.14%, and the marked rate was 5.71%. In other conditions, the effective rate was 45.71%, the marked rate was 5.71%, and the comprehensive effective rate was 68.57%, indicating that the improvement of the quality of life of the TCM health management model is significantly better than that of the traditional hospital discharge treatment.

5. Conclusions

This paper found that the TCM health management model was better than the traditional discharge guidance in improving blood pressure, exercise tolerance, post-TCM syndrome, quality of life, and readmission rate in patients having chronic heart failure with Qi deficiency and blood stasis syndrome. At the same time, it has the advantages of small side effects and low economic burden. However, this paper still lacked multicenter, large-sample case collection and short courses of treatment, and due to financial and technical problems, patients could not be provided with wearable smart devices, which made the application of the Internet insufficient. Therefore, the conclusions drawn in this paper [16] need to be confirmed in more clinical controlled experiments. At the same time, it is necessary to gradually accumulate experience in clinical practice and improve the TCM health management plan. It is hoped that, in the future, the health management of patients with chronic diseases will not only include medicated meals and health preservation, but also be more diverse, so that they can effectively restore their health after discharge and have a more colorful life.

Data Availability

The datasets generated and/or analyzed during the current study are not publicly available due to sensitivity and data use agreement.

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 that there are no conflicts of interest regarding the publication of this paper.

Authors' Contributions

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

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