An Integrated Health Management Service Model of a Close-knit Medical Consortium: The Perspective of Service Chain Theory

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Doctor of Management

Supervisor:
PhD Catarina Marques, Associate Professor,
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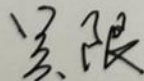
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Abstract

This study develops an integrated health management service model under the framework of a tightly integrated medical community based on service chain theory. The health management services are divided into three parts: early service, mid-service, and late service, and the content of health management services for grassroots chronic disease patients is sorted out. Focusing on service providers, an evaluation index system using the Delphi method is created to evaluate the health management service capabilities. In addition, linear regression analysis is used to study the determinants of self-management behavior and quality of life for chronic disease patients and to evaluate the implementation effect of integrated health management services. Results indicate that, due to economic factors, there is a gap in the ability of health management services provided by close medical communities in different regions. However, those implementing an integrated health management service model have stronger service capabilities, as well as better self-management and quality of life for chronic disease patients. The integrated health management service model can effectively enhance the service capacity of the tight medical community, and the health behavior of chronic disease patients within its jurisdiction, thereby improving the quality of life. This study evaluates the supply and demand sides of integrated health management services, enriching the research perspective of grassroots health service supply at the theoretical level, and providing targeted guidance for the implementation of grassroots health management services at the practical level.

Keywords: Close-knit Medical Consortium; Integrated Health Management Service Model; Service Chain Theory; Self-Management Behaviors; Quality of Life
JEL: I16; I18

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Resumo

Este estudo desenvolve um modelo integrado de serviços de gestão de saúde no âmbito de uma comunidade médica fortemente integrada, baseado na Service Chain Theory. Os serviços de gestão de saúde são divididos em pré-serviço, serviço e pós-serviço, e o conteúdo dos serviços de base para pacientes com doenças crónicas é resolvido. Com base nos prestadores de serviços, é criado um sistema de índices de avaliação utilizando o método Delphi para avaliar a capacidade do serviço. A regressão linear é usada para analisar os determinantes da capacidade de gestão da doença e qualidade de vida de pacientes com doenças crónicas, assim como, o efeito da implementação de serviços integrados de gestão. Os resultados indicam que, devido a fatores económicos, existe uma lacuna na capacidade dos serviços prestados por comunidades médicas em diferentes regiões. No entanto, aquelas que implementam um modelo integrado têm uma capacidade de serviço mais forte, bem como os seus pacientes possuem uma melhor autogestão da doença e melhor qualidade de vida. O modelo integrado de serviços de gestão de saúde pode efetivamente melhorar a capacidade de serviço da comunidade médica e o comportamento de saúde dos pacientes com doenças crónicas dentro da sua jurisdição, melhorando assim a sua qualidade de vida. Este estudo avalia a oferta e a procura de serviços integrados de gestão de saúde, enriquecendo a perspetiva da investigação da oferta de serviços de base de saúde para a população, a nível teórico, e fornecendo orientações específicas para a sua implementação, a nível prático.

Palavras-chave: Consórcio Médico Coeso; Modelo de Serviço Integrado de Gestão de Saúde; Service Chain Theory; Comportamentos de Autogestão; Qualidade de Vida
JEL: I16; I18

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摘　要

　　本研究基于服务链理论，在紧密型医共体框架下构建了一种整合健康管理服务模式。健康管理服务分为前期服务、中期服务、后期服务三个部分，梳理了基层慢性病患者健康管理服务内容。以服务提供者为研究对象，运用Delphi法构建健康管理服务能力评价指标体系，同时采用线性回归分析研究慢性病患者自我管理行为和生命质量的决定因素，并评价整合健康管理服务的实施效果。结果显示，由于经济因素的影响，不同地区紧密型医共体提供的健康管理服务的能力存在差距。然而，实行整合健康管理服务模式的紧密型医共体服务能力更强，慢性病患者的自我管理和生命质量也更好。整合健康管理服务模式可以有效提高紧密型医共体的服务能力，有效改善其管辖范围内慢性病患者的健康行为，从而提高生命质量。本研究对整合健康管理服务的供给侧和需求侧进行了评价，在理论层面丰富了基层健康服务供给的研究视角，在实践层面为基层健康管理服务的实施提供了针对性的指导。

关键词：紧密型医共体；整合健康管理服务模式；服务链理论；自我管理行为；生命质量

JEL: I16; I18

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Chapter 1: Introduction

1.1 General setting

With the rapid development of the economy and society, the living standard of Chinese people is improving day by day, and people are eager to improve their health level. However, with the increasing prevalence of chronic diseases, the demand for medical and health services is also increasing rapidly. Cardiovascular and cerebral diseases, cancers and chronic respiratory diseases are the main causes of death for urban and rural residents in China. The number of patients with chronic diseases discharged from hospitals and the per capita medical cost keeps rising, and chronic diseases have become the biggest threat to the health of Chinese residents. The health management of chronic diseases and their high-risk groups started late, and there are still many challenges in disease prevention, diagnosis and treatment. Although many interventions have been carried out in chronic diseases, including health examination, health assessment, diagnosis and treatment, and certain results have been achieved, there are still many problems to be solved, such as a lack of comprehensive, coordinated and continuous prevention and control system. Residents, especially patients with chronic diseases, need more continuous integrated, professional and high-quality health management services provided by medical institutions at the community level rather than high medical costs and time consumption in large hospitals. In addition, at present, the integration degree of primary medical institutions and services is low, and the ability of medical services is lacking. The medical and health institutions at all levels in the region are expected to constitute a coordinated whole, which is helpful for health service demanders to obtain more convenient integrated health management services, so as to make high-quality medical resources accessible to the community level and improve the efficiency of health resource allocation.

In 2009, the report "Opinions of the Central Committee of the Communist Party of China and the State Council on Deepening the Reform of the Medical and Health System" proposed to "guide general diagnosis and treatment to be accessible to the community level and establish a model of hierarchical medical treatment and differentiated treatment for acute and chronic illnesses". In 2015, the report "Guiding Opinions on Promoting the Construction of a Tiered Diagnosis and Treatment System" emphasized the need for "orderly and effective channeling

of high-quality medical resources to the community level", further integrating medical resources, improving resource utilization efficiency, and enhancing overall benefits. With the deepening of the reform of the medical and health system, the construction of the medical consortium has become an important mode and way to achieve this goal, which has attracted widespread attention from the government and society. In April 2017, the report "Guiding Opinions on Promoting the Construction and Development of Medical Consortium" pointed out that the medical consortium should be built in counties to promote the flow of high-quality medical resources to the community level. Integrating medical service resources and health management services under the medical consortium model and implementing whole-cycle and integrated health management can not only equalize basic medical and health services and realize tiered diagnosis and treatment, but also serve as an important component of deepening the reform of the medical and health system and establishing a basic medical and health system with Chinese characteristics, and can also promote the development of medical and health undertakings, improve people's health and ensure people's livelihood. In order to further standardize the construction of a county medical consortium, the pilot work of building a close-knit county medical and health consortium was launched in 2019 (National Health and Family Planning Commission of the People's Republic of China, 2017), and the first batch of 567 pilot counties and districts began to explore. By building a collaborative mechanism of county-township-village medical institutions, the deep integration among organizations and the reform of external governance systems in the close-knit medical consortium have begun, promoting the formation of a good collaborative relationship among subjects, so as to eliminate "fragmentation" of primary health management. Its core is to build an integrated health management model that provides integrated services.

Although the construction of China's close-knit medical consortium has achieved some results, such as the improvement of residents' health literacy, the increase in the rate of medical treatment in the county, the increase in the number of primary diagnosis and treatment, and the improvement of patient satisfaction, there are still problems such as insufficient integration of medical and prevention, and the integrated health management service model needs to be improved. The report *"The Healthy China 2030 Planning Outline"* proposed the establishment of an integrated medical and health service system with a clear division of labor, complementary functions, close cooperation and efficient operation, and the development of health management that integrates prevention, treatment and management. Health education, health promotion and medical services should be integrated to achieve whole-cycle and continuous management, so as to control diseases, improve life quality, prevent complications and reduce

disease burden. Under the background of accelerating the construction and development of the medical consortium, how to realize the integration of the service ability of health management, the improvement of the service level, the innovation of the service mode and the construction of the linkage mechanism of health management in the close-knit medical consortium at the county level are the major topics that need to be studied at present.

1.2 Introduction of the dilemma / problem

At present, there are some deficiencies in China's primary health management model, such as "fragmented" construction of the current health management system, insufficient coordination among medical institutions at all levels, lack of health ability of primary front-line medical staff, poor awareness of self-health management among the masses, weak cohesion of the management process, more focus on the disease itself and less attention to the application of prevention research. In the current health management model, a complete theoretical framework system has not yet been established, and there is a lack of theoretical analysis and guidance. In addition, the existing primary health management model has not yet provided comprehensive, dynamic, continuous and personalized health management services and has not achieved the purpose of providing patients with whole-cycle and integrated health management services.

The service chain is a kind of supply chain formed by institutions with specific service capabilities through a certain process to meet the needs of service objects. Service organizations form "nodes" on the "chain", and each "node" on the "chain" provides the required services for the demanders. In recent years, Service Chain Theory (Baltacioglu et al., 2007; Cook et al., 2001; Ellram et al., 2004) has been widely used in the field of medical services. For example, Chapman and Cook (2010) applied the Service Chain Theory to hospital blood management, and Mayer (2016) carried out research on the service chain management of medical auxiliary technology. In China, it is mainly used to analyze service chains such as home-based elderly care (Wang, 2013), community-based elderly care (Zhang & Du, 2018), old age security (Wang, 2011), and "the combination of medical and health care" (Tan et al., 2017). In addition, some studies explore the construction of the medical consortium based on the Service Chain Theory, revealing the obstacles and influencing factors of multi-agency collaborative services. Tang (2023) carried out the path on to repair the fault—line of geriatric medical service chain was provided，which were developing a mid—term care model in primary hospitals within the

middle medical union，connecting and integrating medical resources through the Internet，providing better integrated services for elderly patients，and creating a full life cycle geriatric medical service. From the perspective of Service Chain Theory, some scholars proposed to promote the orderly diversion of resources, so that high-quality medical resources can be efficiently used at the community level, and the functions of prevention, treatment, rehabilitation, health care and health education can be integrated to help the primary treatment at the community level. Wang et al. (2017)believed that health services should be centered around the needs of patients, clarify the service types and processes of each institution, optimize the service chain of the entire system, and improve resource utilization while promoting resource integration.

Service Chain Theory provides a feasible theoretical framework for the study of an integrated health service management model under the framework of the close-knit medical consortium. Based on the service chain theory, It can be from the health management service guarantee (common vision, policy supply, payment security, information construction), health management service guidance (technical guidance, training, communication), health management service provision (medical and prevention integration concept), service mode (prevention, control, diagnosis and treatment, rehabilitation integration), health management service power, service evaluation (evaluation and evaluation, supervision party The basic theoretical framework of integrated health management service model was constructed, and the theoretical mechanism and path of integrated health management including whole-cycle control, chronic disease prevention and control, disease prevention and control, medical service and individual behavior change were analyzed. At the same time, the construction of an integrated health management model under the framework of the close-knit medical consortium based on Service Chain Theory has important practical value for improving the current primary health management practice, providing patients with whole-cycle and integrated health management services, optimizing the medical and health service system, and promoting the integrated development of prevention, treatment and management of health management.

This study will take the county close medical alliance as the carrier and the integrated health management model as the core, build the integrated health management model under the framework of the close medical alliance based on the service chain theory, design an index system, and comprehensively evaluate the service capability of the integrated health management providers in the pilot areas. To evaluate the service effect of the comprehensive health management model on the population with key chronic diseases and provide theoretical

and empirical basis for the relevant government departments to formulate primary health management service policies, promote the construction of a closely integrated medical consortium, and implement the hierarchical diagnosis and treatment system.

1.3 Purpose

Based on the perspective of the service chain, this study adopted the method of theoretical and empirical research as well as qualitative and quantitative analysis, constructed the integrated health management service model under the framework of the county's close-knit medical consortium, and established the evaluation index system of the integrated health management service ability of the close-knit medical consortium. The current situation investigation, comprehensive evaluation and implementation effect evaluation of the integrated health management service ability of the close-knit medical consortium were carried out to provide a theoretical and empirical basis for the establishment of a continuous and effective integrated health service system of the close-knit medical consortium. Specific research objectives are as follows.

1. Based on the Service Chain Theory, a theoretical model of integrated health management service mode is constructed from the aspects of health management service guarantee, health management service guidance, health management service provision, health management service motivation and service evaluation in a close-knit medical consortium.

2. Based on the theoretical model, the evaluation index system of integrated health management service ability under the framework of the close-knit medical consortium is constructed, and the integrated health management service ability of the close-knit medical consortium in the pilot area is investigated and comprehensively evaluated.

3. Taking residents' health as the core and based on the survey data of the chronic disease population, the implementation effect of the integrated health management model under the framework of the close-knit medical consortium is estimated in empirical research, and the influence effect of the integrated health management service model on the health behavior, health status and quality of life of the chronic disease population is investigated.

4. Based on the results of theoretical and empirical research, this thesis proposes an optimization strategy for integrating health management service mode under the framework of a close-knit medical consortium, which can provide a decision-making basis for relevant government departments to formulate primary health management service policies, promote the

channeling of advantageous medical resources to the community level, and implement the tiered hierarchical diagnosis and treatment system.

1.4 Research Questions

Based on the Service Chain Theory, this study constructs a theoretical model of health management services with a close-knit medical consortium in the county as the carrier and integrated health management as the core. Based on the investigation of the research sites in Jiangsu pilot districts and counties, the evaluation index system of integrated health management service capacity of the close-knit medical consortium was designed to investigate the status quo and comprehensively evaluate the service ability of health management providers. Taking the key population of chronic diseases as the target of the effect evaluation of the integrated health management service model, the service effect of the integrated health management model of the close-knit medical consortium was evaluated from the perspective of the demand side of health management services.

1. How to build a theoretical framework of integrated health management services in the close-knit medical consortium?

Through literature review and theoretical research, this thesis comprehensively sorts out the theoretical framework and construction methods of health management service models and explores the rules for establishing health management models in and beyond China. Based on Service Chain Theory, this thesis constructs the basic theoretical framework of the integrated health management service model and analyzes the theoretical mechanism and path of integrated health management which integrates whole-cycle control, chronic disease prevention, disease prevention and control, medical service and personal behavior change, from the aspects of health management service guarantee (common vision, policy supply, payment guarantee, information construction), health management service guidance (technical guidance, training, communication), health management service provision (medical and prevention integration concept, service model (prevention, control, diagnosis and treatment, rehabilitation integration), health management service motivation, and service evaluation (assessment and evaluation, supervision methods, feedback mechanism).

2. What is the status of integrated health management services of the close-knit medical consortium in the pilot areas?

This thesis summarizes the relevant practice tools of health management and integrated medicine and analyzes the integration advantages between the close-knit medical consortium

and health management services. On the basis of summarizing the typical models of health management beyond China and the practice of health management in China, and taking the close-knit medical consortium in the pilot area of Jiangsu Province as the research object, the investigation of the current situation of integrated health management services in the medical consortium and interviews with key insiders on the linkage of health management services are carried out; the status quo of integrated health management services in typical cases, the linkage of township health centers and the close-knit medical consortium are investigated; and the basic health status, self-health management ability and health literacy level of residents in the county are understood.

3. How to evaluate the ability of the providers of integrated health management services of the close-knit medical consortium?

Based on the theoretical framework of the integrated health management service model and combined with literature research and practical exploration, the index system of service capability evaluation of integrated health management providers of the close-knit medical consortium is preliminarily extracted from the two levels of integrated service degree (four dimensions: strategic layer integration, strategy layer integration, operation layer integration and technical layer integration) and integrated service capability (four dimensions: service guarantee, service guidance, service provision and service assessment and evaluation). Through expert interviews and consultations, a comprehensive evaluation index system of integrated health management service capabilities of a close-knit medical consortium is finally formed. According to the above evaluation index system, the service capacity of the integrated health management providers of the close-knit medical consortium in the pilot areas and counties of Jiangsu Province is comprehensively evaluated through on-site investigation, and the collaboration, service integration degree and service integration ability of the member units of the medical consortium and the family doctor team in the health management of chronic diseases are evaluated. Combined with typical case studies, the key factors affecting the service capability of whole health management are systematically analyzed, and optimization of medical care is proposed.

4. How to evaluate the effect of integrated health management services of a close-knit medical consortium with residents' health as the core?

Based on the development of health examination and health follow-up services in pilot areas and counties and combined with medical service records, health file databases, questionnaire survey data and other information, the behavior and process of health management services are analyzed. This thesis comprehensively analyzes the health status and

health risk factors of residents, targets people with chronic diseases such as hypertension and diabetes, evaluates the effect of integrated health management services, uses the methods of random cluster sampling and stratified sampling, estimates the effect of integrated health management services of the close-knit medical consortium from the perspective of the demand side of health management services, and investigates the influence of integrated health management service models on health behaviors, risk factors, health status and quality of life of people with chronic diseases.

5. How to summarize and put forward the countermeasures and suggestions to optimize the comprehensive health management service mode closely combined with the medical consortium.

Based on the above survey and research results, this thesis puts forward countermeasures and suggestions to optimize the integrated health management service model of the close-knit medical consortium, so as to provide a theoretical and empirical basis for providing targeted, personalized and continuous integrated health management services for the covered population in the close-knit medical consortium area, and promoting the effective implementation of the tiered diagnosis and treatment system.

1.5 Research Roadmap and Thesis Structure

Figure 1.1 presents the thesis research roadmap. This structured approach ensures a comprehensive investigation into the integrated health management service model, addressing both theoretical and practical aspects.

The research began with a comprehensive literature review to understand the current state and gaps in integrated health management services. Based on this review, the research problem was defined, and research questions were formulated. The theoretical framework was then developed by adapting the Service Chain Theory to the context of a close-knit medical consortium. This involved constructing a theoretical model tailored to the specific needs of the research. Next, the methodology was meticulously designed, including the development of survey instruments and evaluation indexes. Preparations were made for data collection through questionnaires and expert consultations, ensuring the quality of the collected data.

Data collection was carried out through interviews and questionnaires with relevant stakeholders. The collected data were analyzed using statistical methods to evaluate health management service capabilities and the determinants of patient outcomes. Specific case studies were conducted to explore integrated health management models, identifying key motivators and factors influencing service effectiveness. An empirical evaluation was

conducted to develop and validate evaluation indicators for integrated health management, identifying regional disparities.

The findings were then discussed in the context of existing literature and the theoretical framework, addressing regional disparities and proposing improvements. The research concluded with a summary of key findings and their implications, offering recommendations for policy and practice. The limitations of the study were acknowledged, and suggestions for future research were described.

Figure 1.1 Research Roadmap

1. **Initial Research and Problem Identification:**
   - o Conduct a literature review to understand the current status and gaps in integrated health management services.
   - o Define the research problem and formulate research questions.
2. **Theoretical Framework Development:**
   - o Develop a theoretical model based on Service Chain Theory.
   - o Adapt the theory to the context of a close-knit medical consortium.
3. **Methodology Design:**
   - o Design research methodology, including survey instruments and evaluation indexes.
   - o Prepare for data collection through questionnaires and expert consultations.
4. **Data Collection:**
   - o Conduct surveys and interviews with relevant stakeholders.
   - o Implement quality control measures for data collection.
5. **Data Analysis:**
   - o Analyze collected data using statistical methods.
   - o Evaluate the health management service capabilities and determinants of patient outcomes.
6. **Case Study Analysis:**
   - o Conduct case studies on specific medical consortiums to explore integrated health management models.
   - o Identify key motivators and factors influencing service effectiveness.
7. **Empirical Evaluation:**
   - o Develop and validate evaluation indicators for integrated health management.
   - o Perform comprehensive evaluations and identify regional disparities.
8. **Discussion and Synthesis:**
   - o Discuss findings in the context of existing literature and theoretical framework.
   - o Address regional disparities and propose improvements.
9. **Conclusion and Recommendations:**

o   Summarize key findings and their implications.

o   Provide recommendations for policy and practice.

o   Identify limitations and suggest areas for future research.

Following the research roadmap, the structure of the thesis is as follows:

Chapter 1 describes the current situation and the motivation for the study. It establishes the research purpose, outlines the main objectives and formulates the research questions.

Chapter 2 reviews the state of integrated health management services both internationally and in China. It discusses the development and application of these services at the primary level in China and the relevance of the Service Chain Theory in health service management.

Chapter 3 presents the theoretical framework of the Integrated Health Management Service Model of a Close-knit Medical Consortium, which delves into Service Chain Theory. It starts to describe the definition, model, and influencing factors of the service chain, then it explores its applicability to health management services and presents the theoretical model adapted to the context of a medical consortium.

Chapter 4, Research Method, details a comprehensive approach combining qualitative and quantitative methods to develop the integrated health management service model. It includes literature research, case analysis of services in Jiangsu Province, and expert consultations. Data were collected through carefully designed interviews and surveys, targeting key stakeholders and patients with chronic diseases. The development of the evaluation index is presented, employing methods like the Analytic Hierarchy Process (AHP) and Weighted Rank-Sum Ratio (WRSR). The statistical techniques conducted to analyze the survey data are also described.

Chapter 5 presents a case analysis of integrated health management services in Jiangsu Province. It includes an empirical study and evaluation indicators, discussing service guarantee and evaluation, screening of the evaluation index system, and comprehensive evaluation. This chapter also examines factors affecting the health of patients with chronic diseases, analyzing sample characteristics, self-management behaviors, quality of life, and follow-up services and their effects.

Chapter 6 summarizes a specific case study on the health management services of the Bin Hai County Medical Community. It provides a comprehensive evaluation of the services, reflects on regional disparities, and identifies and discusses influencing factors of self-management behaviors and life quality among patients with chronic diseases.

Chapter 7, Conclusion, summarizes the key findings of the research, highlighting regional disparities in service capability, the integrated health management service model, the

importance of health education and behavioral guidance, and the need to enhance social support and collaboration. The chapter concludes with a description of the study's limitations and future research prospects.

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Chapter 2: Background

This chapter sorts out the current status of health management research in and beyond China, summarizes the development and practice of health management services, expounds the theoretical basis of the service chain and its application in the field of medical and health care, and puts forward the research questions of this study, thus providing a basis for subsequent research.

2.1 Research status of integrated health management services in and beyond China

2.1.1 Research and development of integrated health management services beyond China

2.1.1.1 The United States - market-led health management model

In the market-led health management model, medical insurance institutions adopt a managed service model, which effectively integrate the provision and payment of health management services, and effectively control medical and health expenses on the basis of protecting residents' health, so as to optimize resource allocation, improve residents' health level, and maximize health benefits (Dan, 2023).

In the United States, seven out of 10 people receive various health management services on demand (Liu, 2016). Health Maintenance Organizations (HMOs) are the earliest and most commonly managed health care service model. Through the establishment of a "gatekeeper + prepayment" organizational form, part of fees is prepaid to the health service provider according to some standard (e.g., by per capitation or disease) according to the payment plan, and patients need to be referred by their family doctor (PCP, Personal Care Physician) for treatment at the next level of health care. According to the specificity of medical service providers, HMOs are divided into closed and open models. In the closed model, payment plans form one-to-one relationships with health care providers. Under the open model, payment plans, and medical service providers have a many-to-many contract relationship. The most typical one is called the Independent Provider Association (IPA) model. Under this model, the payment plan is signed

to a consortium of doctors, and the per capitation fee is paid to the consortium, which in turn signs up with internal doctors, but doctors can also sign up with other payment plans. Currently, the open mode is more common than the closed mode. Another is the staff-model HMO, which employs doctors and pays for them directly. This model is already rare in payment plans operated by commercial companies because of the highly specialized nature of healthcare management itself (Liu, 2016).

However, with the change of times, the market share of HMOs in the traditional sense has gradually shrunk, and the generalized managed medical model has become the backbone of the market. At present, the most common managed medical model in the United States is the Preferred Provider Organization (PPO), which accounts for more than 60% of managed medical care. By guiding patients to medical and health service providers with better cost control, the purpose of cost control is achieved. Exclusive Provider Organizations (EPOs) stipulate that the insured can only go to visit the designated doctors and that the fee can be reduced if charges are made according to the price of the service item, otherwise, patients will pay for medical treatment themselves. Through the network of medical and health service providers or insured persons, Point of Service (POS) selects healthcare doctors who provide health management and basic medical services and are responsible for the referral at no additional cost (Assefa et al., 2020; Bonora, 2002; Bormann & Swart, 2014; Dunn & Shapiro, 2015). If one goes to see a doctor other than the selected one, one needs to pay the fee first and then apply for compensation, and the out-of-pocket payment ratio is relatively high.

2.1.1.2 UK – government-led integrated health management model

The UK's NHS is a representative of the tax-based health management model, which is funded by the government and provided by general practitioners, fulfilling the role of health "gatekeepers" (Ding, 2009; M. L. Wang, 2018; NHS, 2011; NHSC, 2015; Sun, 2017; Wang, 2013). The NHS is known for its efficiency, fairness and comprehensiveness, comprising four components: administration, service procurement, health care delivery and supervision and regulation.

Because the social services and health services are under two different administrations: the local authority and the health department, there is a lack of coherence between service providers. In addition, the NHS involves multiple service institutions, including community health, hospital specialty and emergency care, general practice, and mental health. The lack of effective communication and connection among service providers leads to fragmentation, duplication of services and waste of resources within the service system, which affects the utilization of

medical and health services by citizens (Grandes et al., 2017). In recent years, the NHS has made many attempts at reform, integrating various services and extending them to the community, promoting the development and progress of social public services, integrating services with the needs of communities and residents as the core, improving service fragmentation by strengthening the cooperation between local governments and Clinical Commissioning Groups (CCGs) and reducing the burden of diseases (Himmel et al., 2000). The NHS Commissioning Groups are the leading authority for the purchase of services in primary care and specialist services. Local (CCGs), composed of general practitioners, nurses, and other professionals, are responsible for the allocation of local health resources, planning, and purchasing of services. In addition, the NHS Commissioning Groups and the Hospital Regulatory Authority work together to set the price and payment coverage of medical services. The medical service organization obtains its own income by signing the commission agreement with the commissioning groups. In the UK, hospitals mainly provide specialty and emergency services, while general practitioners (GPs) provide related services by signing service agreements with individuals. Medical quality and financial operations are supervised by regulatory institutions, and the designation of clinical guidelines and standards is carried out by the National Institute for Clinical Excellence (NICE).

2.1.1.3 Japan - community integrated health management model under the rule of law

Japanese average life expectancy ranks first in the world (Chen, 2010), which is closely related to the construction and development of health management. The Japanese government established the "health manual" for residents through health management services, including health examination, assessment and help, health investigation, health education, health promotion activities and other links; through legalization, health management services are guaranteed to have rules to follow and laws to rely on. At the same time, people's health rights and related health management obligations are also stipulated (Li, 2013), so as to enhance people's awareness of health management. Local health management organizations had been optimized, a sound and perfect community-integrated health management model had been developed, supporting systems had been formulated, network facilities had been improved, a scientific and rigorous assessment framework had been established, and disease prevention and control had been guaranteed through a community health examination, cancer screening, lifestyle and behavior intervention and other services. Targeted comprehensive health management services had been provided to the elderly population and the high-risk population

with chronic diseases (Tang et al., 2014). The main practices of the Japanese model include the following four aspects:

(1) Establish a community-integrated health management organization structure with clear functions and responsibilities

In 2000, on the basis of *Measures to Improve National Health* and *Basic Guidelines for Promoting Community Health Facilities* (Japanese Ministry of Health, Labor and Welfare, 2021), Japan put forward "*Actions to Promote National Health in the 21st Century*", which were optimized in 2012. Through health surveys and lifestyle interventions, residents' lifestyles and social environments can be improved, and health risk factors can be controlled to improve residents' life quality (Ye et al., 2001). Communities effectively utilize health resources and carry out health education and publicity to enrich citizens' healthy spiritual life, promote mutual support, and guide good health habits (Japanese Ministry of Health, Labor and Welfare, 1994).

(2) Strengthen cooperation between communities and residents, and attract extensive participation of social forces

By attracting the extensive participation of social organizations and guiding the active cooperation of residents, Japanese communities have developed a series of cross-departmental coordinated policies and strategic actions to promote the effective development of community health management. The community actively cooperates with relevant medical insurance institutions to carry out various health activities, including physical examination and disease screening. Community residents also actively cooperate with and participate in community health management activities, which not only enhances their own health awareness, but also improves their ability to solve health problems.

(3) Implement health management of the whole population to reduce the occurrence of diseases

The practice of community health management in Japan aims to prevent and control the occurrence of diseases by improving habits and intervening lifestyles, and its core has been transformed into active monitoring and behavioral intervention of health risk factors. Its services include specific health guidance and comprehensive care for key groups who are at high risk of diseases and suffering from diseases, with special emphasis on physical examination, disease screening and comprehensive intervention for healthy and sub-healthy groups. The service objects cover the whole population and the whole cycle, and it implements health maintenance and long-term dynamic management for people with different health conditions and life cycles (Li, 2017).

(4) Establish a scientific and effective community-integrated health management

assessment system

On the one hand, the assessment system of Japanese health management pays attention to the specific and measurable overall goal; on the other hand, it also pays attention to the health of residents in all aspects, which includes both the overall consideration and the examination of the health cognition ability of vulnerable groups. Assessment indicators are set up based on the reality. They are convenient and measurable, cover different dimensions and co-exist with the result indicators, so they can better measure the achievement of the goal (Japanese Ministry of Health, Labor and Welfare, 2021).

2.1.1.4 Germany - integrated health management model combining health insurance and preventive medicine

Germany realizes the service integration of medical service, health management and health insurance through the coordinated operation of medical treatment, prevention and insurance, thus promoting service accessibility. Germany promotes the rapid and sustainable development of health management through national health education, insurance intervention in health management, community disease prevention and control, and sports (Li, 2017; Wang & Fan, 2022). First, it pays attention to physical examinations, and provides citizens with a free physical examination service every year, such as irregular physical examination, through which insurance companies can increase the insurance premium. Second, the government attaches importance to national fitness. The focus of sports work is to promote national sports and carry out sports-related activities such as sports tourism. Third, the government has begun to focus on enterprise management. The German *Labor Protection Law* stipulates that enterprises need to establish safety and health committees in accordance with the law, establishes the concept that "employee health is the foundation of the enterprise", and holds meetings and activities from time to time. Fourth, the government and relevant organizations promote healthy eating, formulates dietary guidelines, guides residents to eat healthily, improves health literacy and health awareness, and develops healthy recipes for adolescents through the "Children's Healthy Breakfast Actions". Five, it establishes health records, assists doctors in diagnosis based on the basic health status of electronic health card holders, electronic medical records and other information, and analyzes the national health status through data analysis.

In addition, as the first country to implement a social security system, almost all citizens in Germany participate in medical insurance (including statutory health insurance and private insurance), and health management is also closely integrated with the medical insurance system. In 2002, the German government passed legislation to include health management in the scope

of medical insurance. Considering the direct impact of the health status of the insured on the company's economic benefits, in addition to bearing the medical insurance costs, the medical insurance company also carries out different health education, management and behavioral interventions for the insured (Han, 2017).

To sum up, the United States, the United Kingdom, Japan, and Germany have all established their own unique health management models. Although there are differences, the purpose is to better protect national health. The United States takes managed care as the framework of the health management model (Kobrinskii et al., 2019; Kovach et al., 2019; Liu & Wang, 2016); the UK health management model focuses on national overall planning (Ma & Ward, 2020; Matkin & Ring, 2020; Milne & Kaitin, 2010); the Japanese health management model emphasizes community health management (Linden et al., 2003; Murray & Frenk, 2000; Simonet, 2014); and the German health management model pays attention to health knowledge publicity and institutional support (Starfield et al., 2005; Zeisberger et al., 2019), as shown in Table 2.1.

Table 2.1 Summary of integrated health management models of various countries

Country	Features	Experience reference
United States	Market-led health management model	The development of market-led health management has burst out strong vitality. It reduces the economic burden on the government.
UK	Government-led integrated health management model	Market-led health management ensures the security of private information. The government is responsible for the funds, and the government needs to coordinate the funds to guarantee and support the implementation of health management.
Japan	Community-integrated health management model under the rule of law	①Laws and regulations can be adopted to standardize health management and formulate work standards. The cost of breaking the law should be increased to ensure quality and let the public enjoy high-quality health management services with peace of mind.
Germany	Integrated health management model combining health insurance and preventive medicine	Insurance institutions intervene in health management to improve health management coverage through universal medical insurance. Attention should be paid to disease prevention, as well as reasonable and efficient use of health management funds, to ensure the sustainable development of health management

2.1.2 Research and practice of integrated health management services at the primary level in China

2.1.2.1 Research on health management services in China

The development of health management services in China lags behind other countries, and the concept of health management has entered China since the end of the 20th century. The

professional recognition of national health managers marks the initial development of health management practice, thereby standardizing the construction of the personnel level and ability of the health manager team. The establishment of the Health Manager Expert Committee and the Health Management Branch of the Chinese Medical Association, as well as the establishment of the *Chinese Journal of Health Management*, formed a relatively standardized theoretical system (Chen & Huang, 2007; Li & Guo, 2019).

Health management is the whole process of monitoring, analyzing and evaluating the health status of individuals or groups, providing health consultation and guidance, and intervening in the health risk factors. Its purpose is to effectively utilize limited resources to maximize health benefits (Dunn & Shapiro, 2015). Wang and Liu (2007) sorted out and summarized the health management of chronic diseases: first, to collect the basic health data of residents; second, to sort out, analyze and evaluate the basic health data of residents, and find, classify and grade the risk factors that affect health; third, to carry out health interventions in combination with residents' lifestyles and habits. Li and Huang (2008) constructed the integrated chronic disease health management service model of community health services with the function of mutual supplement and promotion, thus realizing the purpose of chronic disease prevention and control, and improving the health level of residents. Wu and Jian (2015) clearly pointed out that the accessibility and utilization rate of community health management services were poor, and that the social determinants affecting the availability of health management services for patients with chronic diseases were occupation, household registration and household income. Guan et al. (2018) conducted in-depth research on the status quo and the effect of health management services for patients with chronic diseases, and found that the factors affecting the control effect of chronic diseases in patients were the trust in doctors, compliance with doctors, and self-management and monitoring.

The document *"Opinions of the CPC Central Committee and the State Council on Deepening the Reform of the Medical and Health System"* (Kong, 2012) clearly pointed out that the prevention and control of chronic diseases should be included in the national basic public health projects, and required the establishment of residents' health records, health education and health promotion, health examinations for the elderly over 65 years old, and health management services for patients with chronic diseases. Miao (2013) investigated and analyzed health follow-up services for rural diabetic patients, and the results showed that the overall utilization rate of health follow-up services was low due to the influence of factors such as service utilization intention, active consultation degree of health knowledge, medication compliance and awareness of diabetes knowledge. The satisfaction with health follow-up

service was affected by the course of the disease, the initiative to consult village doctors/township doctors about health knowledge, and the question of whether there were complications during the follow-up. L. X. Wang et al. (2018) investigated and analyzed the status quo of basic public health services in Gansu Province, and found that the overall awareness rate of the key population of basic public health services was 66.85%, and that the overall satisfaction rate was only 59.16%. The awareness rate was relatively low and the awareness rate of various projects was significantly different. It was suggested that publicity and promotion should be enhanced to improve the ability of primary medical and health services.

Chronic diseases not only seriously endanger the health of residents, but also bring huge economic and social burdens to individuals, families and society, so health management plays an important role in the prevention and control of chronic diseases (Iheanacho et al., 2020; Mannino & Buist, 2007; Zhang et al., 2019). With the change in medical concepts and modes brought about by the change in the disease spectrum, people pay more attention to health. The improvement of health literacy and the growing demand for health requires the government, society and medical and health institutions to actively respond and take various ways to strengthen health assessment and effective intervention for healthy people, sub-healthy people, high-risk people and people with chronic disease (Lv & Deng, 2016), promote patients' self-management, improve patients' quality of life, reduce the expenditure of medical and health expenses (Chen & Hu, 2019; Huang, 2006; Huang & Zhong, 2014).

2.1.2.2 Research on integrated health management service model in China

The problem of service fragmentation and discontinuity has plagued many countries and regions, and the concept of "integration" has been increasingly valued by health policymaker's makers and researchers in and beyond China in this context (World Health Assembly, 2016; World Health Organization, 1996). However, there exists the problem of the lack of continuous and collaborative integration. Especially in the context of implementing the optimal allocation of county medical and health resources with the medical consortium as the starting point, how to better "combine" after "division" (clarify the functional positioning of medical institutions at all levels) can better reflect the people-oriented thinking, which is the essence of the integrated health management service development of the medical consortium (He et al., 2018).

Scholars in China have conducted research on integrated health management services, advocating health-centered and integrating medical and health services such as health promotion, disease prevention, treatment and hospice care with the services provided by medical institutions in the region, thus providing diversified and continuous health management

services and providing lifelong and continuous services for people (Singer et al., 2011; Tang, 2015; World Health Organization, 2015).

In recent years, China's health management has developed rapidly, and various places have practiced and explored integrated health management service models. This thesis sorted out and analyzed the research on the integrated health management model in China, as follows.

(1) Integrated health management model relying on hospitals

Relying on the hospital's medical resources and superior technology, and based on the trust of the masses, Sichuan Provincial People's Hospital carried out a practical exploration of health management services through the "separation of the medical treatment process from the health examination process" to experience physical examination information and medical treatment. Zhu et al. (2018) believed that under the background of the Healthy China strategy, hospitals should take people's health as the goal, pay attention to the dual rights and interests of society and health, and explore a new situation in health management. Zhang et al. (2014) believed that in the supply of health management services, hospitals have advantages in medical technology and equipment, discipline teams and service teams, and should actively play the advantages of resource allocation to carry out health management services and improve the attributes of social welfare.

(2) Integrated health management model relying on community health service organizations

Community health management is characterized by providing services for ordinary residents, especially for key groups and vulnerable groups, and taking advantage of wide service coverage, rich service content and low service costs to improve the accessibility and universality of services (Zhang et al., 2014). Based on the family doctor team, Li et al. (2018) conducted an in-depth analysis of the integrated health management model in Hubei Province, organically integrated health management with contracted services to enrich service content and explore personalized and customized service packages, and provided residents with continuous and appropriate health management services with general practitioners as the service core. Yang (2017) believed that integrated health management services should be centered on primary medical and health institutions, covering the whole population in the community, providing whole-cycle health management services, advocating the integration of health management into community medical and health services, and forming a continuous health management service system (Hao et al., 2014).

(3) Integrated health management model relying on the centers for disease control and prevention

Relying on the center for disease control and prevention, Shanghai has established a medical and prevention integration platform - a health management platform for chronic diseases, promoted integrated services of common prevention of multiple diseases, explored integrated and precise chronic disease health management of information sharing, formed a three-level service system of "city-district- community", improved the quality and effect of chronic disease health management, and realized the integrated and whole-process health management of "people first". Based on the integrated management system of chronic diseases at the municipal and district levels, Shanghai has established a people-centered comprehensive management system, classified healthy people, high-risk people and sick people, provided treatment, management and intervention of diabetes, hypertension and other chronic diseases based on electronic health record data, and provided personalized and precise health management service plans based on residents' lifestyles and habits, thus improving residents' self-management capabilities. Zeng et al. (2014) believed that the center for disease control and prevention has its obvious advantages in integrating health management services, with rich work experience and skilled health testing technology. Song et al. (2018) believed that disease prevention and control could be organically integrated with health management by strengthening the responsibilities of the center for disease control and prevention and establishing the concept of general health.

(4) Integrated health management model of regional medical alliance (medical consortium)

The core of health management under the framework of the medical consortium is to realize tiered diagnosis and treatment through the integration of medical and health resources in the region, so as to improve the health management and service ability at the primary level. Zhang et al. (2015) found in their research that the integrated health management model based on a medical alliance (medical consortium) can improve the effectiveness and continuity of health management services for chronic diseases such as diabetes and hypertension. Dong et al. (2017) believed that by promoting the construction of the close-knit medical consortium, high-quality resources could be channeled to the community level and the level and ability of integrated prevention and control of chronic diseases at the primary level could be promoted through the coordination of policy support, information technology, talent team and management and operation, so as to improve residents' willingness to seek medical treatment and promote the management level of chronic diseases at all levels and various medical institutions in the medical consortium.

(5) "Internet +" integrated health management model

Internet technology is used to integrate hospitals, communities and families, and medical

and monitoring devices are used to collect the health data of residents and their family members. Through big data information sharing, the health status is transformed into intelligent network information to guide and assist the provision of health management services. With the development of the social economy and the update of science and technology, residents' demands for health management services are increasing. The application and promotion of Internet technology in the medical and health field have promoted the integrated health management service model of pre-disease prevention and control, convenient medical treatment during disease, post-disease rehabilitation nursing and psychological counseling, thus enhancing the level of disease prevention and control (Liao et al., 2019) .

(6) Integrated health management model with the joint management of hospital physicians, primary general practitioners and health managers

Hospital physicians, primary general practitioners and health managers form a "1 + 1 + N" service team to provide residents with personalized and continuous health management services, so as to improve service utilization and improve the level of chronic disease health management. Liu (2016) investigated the Xiamen model in the field, and believed that to establish an effective health management service operation mechanism among hospitals, grassroots and residents, it is necessary to start from the service capacity, service motivation, service pressure and performance management of the service system, so as to promote hospitals to "let go and be willing to let go", encourage grassroots to "be willing to take up and have the ability to take up", and guide residents to "be willing to go and want to go".

2.1.2.3 Integrated health management service practice under the framework of the close-knit medical consortium in China

(1) Integrated health management service model based on health and medical big data under the framework of the close-knit medical consortium in Shenzhen Luohu

Guided by the principle of "less illness, less hospitalization, less burden, and better treatment" for residents as well as meeting the health needs of residents, aiming to provide the whole-cycle and high-quality health management services for people, and based on the regional close-knit medical consortium, the Healthy Luohu App and the supporting cloud platform were developed and launched, data in the medical field, such as health records, electronic medical records, medical images, physical examinations, outpatient and emergency care and hospitalization data were integrated, the resources of hospitals, primary health care institutions and family physician teams were integrated, so as to promote service connection through data sharing and improve the quality and efficiency of health management services.

Through the Healthy Luohu App, medical data and related resources within the medical group can be accurately queried anytime and anywhere. The doctor terminal is equipped with functional modules such as health management, health examination, disease diagnosis and treatment, patient management and information reply, which can be classified and managed according to the data information of patients' disease types and conditions, providing assistance for doctors to develop accurate and personalized medical and health management services and realizing health management. Through the platform, relevant consultation on health management and disease self-management will be released to provide residents with scientific and effective healthcare knowledge and improve their health literacy. There are functional modules for signs management, chronic disease management, health assessment and health information at the resident terminal. According to the data analysis of vital signs, family doctors and residents can maintain the data. The platform will alarm indicators beyond the reference range and send them to the mobile terminal to remind the indicators of changes and timely monitoring, thus generating health risk assessment reports and matching scientific and effective health management and health promotion plans for residents. Through the platform, residents can actively participate in health questionnaire measurements such as TCM (Traditional Chinese Medicine) constitution identification and mental health evaluation, providing multi-dimensional and all-round data references for health management services.

(2) Practice of Integrated Health Management Services Combining Medical Treatment and Prevention in Sanming City, Fujian Province

Sanming City is a national model for medical and health system reform. Its reform process has undergone two stages: the comprehensive integration of medical institutions and the full promotion of the integration of medical treatment and prevention. Public medical institutions at the county, township, and village levels have been consolidated into a unified entity, establishing a county general hospital with a unified administrative management team and a comprehensive health service network. In recent years, the city has actively explored the construction of a health care system centered on "comprehensive health" by establishing a leadership group for the integration of medical treatment and prevention. This group, led by key leaders from each county, is responsible for coordinating and implementing related work. Deputy leaders include the Party Secretary of the General Hospital, the Director of the Health Commission, and the Deputy Director of the County Government Office. The group also includes multiple members such as the Deputy Director of the Health Commission, the Director of the County CDC, the Director of the County Health Supervision Institute, and the President of the Maternal and Child Health Hospital. The office is headed by the Party Secretary of the

General Hospital, with the CDC Director serving as Deputy Director, and is responsible for implementing the medical-prevention collaboration plan, formulating and executing projects, and supervising integration work. Various working groups have been established to focus on health education, digital information sharing, school health, maternal and child health management, and other areas, refining tasks and coordinating the functional positioning of each group within the framework of medical-prevention integration.

The government has issued a series of documents on the construction of the medical-prevention integration system and performance assessment plans. These documents emphasize the integration of medical services with disease prevention services, which has been effectively implemented through various forms, such as integrating medical-prevention practices into hospitals, township health centers, village clinics, and promoting self-health management. The General Hospital has included health management in its annual salary assessment indicators, linking doctors' performance with residents' health outcomes. The focus of medical performance has shifted from "increasing quantity" to "reducing quantity" and "improving health." Family doctor contract services are promoted using medical insurance and public health funds, and home care services for contracted residents are included in inpatient reimbursement. This fosters the integration of prevention and treatment within the overarching concept of comprehensive health.

(3) Integrated health management service model with the health-based elderly care service supply as the core in Huangpi District of Wuhan

Elderly patients suffering from chronic diseases with a long course of the disease need continuous and comprehensive health management services. Huangpi District of Wuhan, relying on the close-knit medical consortium, pays special attention to the elderly groups, starts from the supply-side structural reform, enriches the service content, optimizes the service supply, takes the demand of the elderly service as the development direction, integrates the health service demand of residents and their families, and establishes an integrated health management service mode integrating home care, daycare and the combination of medical and healthcare. It also provides personalized and customized health management services for the home-based elderly and explores a new path for the integration of medical and healthcare that suits the characteristics of Huangpi. To realize the linkage and integrated operation of medical treatment, prevention and rehabilitation, it establishes the concept of "proactive prevention before disease, scientific management after disease, and uninterrupted tracking service", and innovates the systems and mechanisms of operation, security, management and constraint.

It is important to establish a health management consortium under the framework of the close-knit medical consortium, build a demand-oriented and Internet-based intelligent health management service system based on the elderly's needs for health, construct a database platform to collect health information and provide medical services in the region, improve the construction of information platforms at the district and street levels, and strengthen self-prevention and health management of key population groups.

Health management institutions are encouraged and supported to become members of the health management consortium to provide professional, standardized and personalized smart health management services. Neighborhoods, communities and towns should investigate the elderly and their families within their jurisdiction to understand their service needs, establish community health management service rooms, carry out day care services, promote family beds, and take elderly care services, long-term care and other services as an extension of the services of medical institutions in the health management consortium.

In summary, China's research on the integrated health management started late. The service system needs to be improved, and there is a lack of standardized model construction, service standards and a professional talent team training system. There are problems such as unreasonable resource allocation, incomplete hardware facilities, inadequate service integration, and unsystematic assessment and evaluation, and health management services are diversified and fragmented. Therefore, it is urgent to explore an integrated health management service model with China's regional characteristics and great universality under the framework of the close-knit medical consortium.

2.2 Application of Service Chain Theory in medical and health service management research

The concept of Service Chain (SC) was first proposed by Edward at an academic conference in 1999, in order to meet the needs of consumers to the greatest extent, the service chain should connect multiple forces such as governments, banks, institutions, enterprises, social organizations and others to form a service network (Anderson, & Morrice, 2010; Liu & Yin, 2011). Service Chain Theory believes that organizations cannot survive independently, and that there is an invisible chain among enterprises, governments and social organizations to connect them, reach consensus through information feedback or negotiation, and further improve service quality and efficiency through chain relationships (Ellram et al., 2004; Qi & Wang et al., 2006). The chain links the service network built by various organizations and makes them

work together to meet the different needs of consumers (Niu, 2007). The service chain is characterized by initiative, foresight, sociality, integrity and symmetry, and its function and structure interact with each other (Hu & Ning, 2003). With the rapid development of the social service industry, Service Chain Theory, as an important theory in the field of public management, has gradually begun to receive attention and has played an important role in the globalized economy. At the same time, consumers begin to ask for high-quality and personalized services, which promotes the development of Service Chain Theory. Service chain has also become a hot topic in the field of management, which has attracted extensive attention from scholars and practitioners in different disciplines.

Scholars in and beyond China have studied the application of Service Chain Theory in the field of medical and health services to a certain extent. Cook et al. (2001) first applied the traditional supply chain management to the medical service industry, optimized the hospital blood service supply chain, and developed a new network data management system. Many scholars, such as Johnson, Mustafee and Taylor, have conducted research on the blood service chain successively. Cherian et al. observed the bullwhip effect and believed that the medical service chain also showed dynamic behavior, suggesting that reducing capacity adjustment and service delay would have better effects. Samue et al. (2010) analyzed the health service supply chain system, established a model through system dynamics, took a hospital in India as an example, and divided the medical treatment process into registration and classification, consultation with doctors, detection and treatment, which reduced the service and capacity delay and greatly improved the patient treatment efficiency and the utilization rate of hospital medical resources. Polater et al. applied in Service Chain Theory to logistics management in hospital management. Its main participants include manufacturers (drugs, medical equipment and medical supplies), distributors, medical service providers, medical groups, insurance companies, government agencies (such as social security services), employers, government supervision agencies and users of medical care services. A general service chain model for the service industry was constructed, which includes all the elements of the service chain and defines the management activities needed to effectively manage the service chain in the context of healthcare. Chen et al. (2020) carried out collaborative innovation on the medical service supply chain from the perspective of users. Medical manufacturers should actively collect suggestions from users and hospitals, so as to obtain valuable feedback in the development and testing stage and highlight the significant influence of user participation. Srivastava and Singh (2021) discussed service supply chain performance in the healthcare field from the perspective

of suppliers, and also stressed the importance of practitioners integrating medical service supply processes and patient centered.

In China, Hu and Ning (2003) as well as Qi (2006)were the first to conduct research on the service chain. Service Chain Theory runs through the whole process of service, from the supply side, and demand side to after-sales service. Du et al. (2008) embedded the service chain in the medical field, defined the concept of the medical service chain, controlled the logistics, information flow and capital flow of medical institutions in the whole process from procurement to service provision, and connected patients, medical institutions and their suppliers into a completely functional network chain (Chen, 2008; Du et al., 2008). Ye (2013) focused on the rural tertiary medical service network, comprehensively analyzed the rural vertical medical service chain from the multi-dimensional perspectives of patients, information, as well as internal and external environment, put forward the ideological requirements of "chain flow integration", paid attention to the collaborative provision of medical services and the standardization of patient flow, and revealed the obstacles to multi-institutional collaborative services and the influencing factors of patient tiered diagnosis and treatment. Shi (2018) made suggestions on two-way referral and constructed a structural model of the medical service chain to ensure the sustainability of the medical service chain. According to the construction of the medical consortium in Haishu District, Lv (2017) proposed to build a "service chain" to promote the orderly diversion of resources, so that high-quality medical resources can be efficiently used at the primary level. Based on the Service Chain Theory, Li (2018) constructed the framework of the urban community health service chain, divided the service process into early, middle and late stages, and took the government, health institutions and various social organizations as the service providers. The specific service content is delivered by the "node" of the government system service chain, the "node" of the basic medical service chain, the "node" of the public health service chain, the "node" of the elderly service chain, and the "node" of complaints and suggestions service chain. Paying attention to the systematic planning of the service process is conducive to building the community health service supply chain with reasonable establishment, sound function, complete process, scientific operation and standardized supervision. From the perspective of the service chain, it is proposed to strengthen systematic planning, accelerate the change of concept, strengthen the positioning of rights and responsibilities of various institutions, enhance the participation of service audiences, and provide specific schemes for the construction of "urban community health service system" (Y. Y. Li, 2018).

Service Chain Theory is widely used in the field of elderly care services in China. Zhang (2012) put forward the concept of a community-based elderly care service chain and introduced it in detail. According to the service needs of the elderly, Wang (2011) introduced the service chain into the public service field and built the elderly security service chain. Based on Service Chain Theory, Wang (2013) analyzed the problems existing in the development of home-based elderly care service, constructed the "home-based elderly care service chain", and divided it into three stages: service supply, service delivery and service utilization. In the service supply, the government, relevant departments and organizations are the main body, responsible for formulating policies and launching appropriate service items, and service groups provide services according to consumption guidance information and product information. In service delivery, enterprises and social organizations are the main body to deliver service products to the elderly and their families. Service utilization is the process by which service products are used by the elderly and their family members. Corresponding problems and countermeasures are proposed for different service stages, and the rights and responsibilities of the government, the market, social organizations, communities and families should be strengthened, and the application of Service Chain Theory in the field of elderly care should be promoted. Tan et al. (2017) proposed to integrate collaborative public management into the construction of the "combination of medical and health care" service chain management model. Based on the Service Chain Theory, Zhang and Du (2018) pointed out that the community becomes a node in the service chain, a communicator in the service production stage, an agent in the delivery stage, a supervisor in the utilization stage, and an intermediary between residents and elderly care institutions, to help residents obtain more satisfactory elderly care services. Meng (2018) constructed the "service chain" of home-based elderly care purchased by the government, including three links of service delivery, service utilization and fund guarantee, correctly handled the relationship among the government, service providers and the elderly, and optimized the way of elderly care services purchased by the government. Lv (2020) believed that there is a service chain structure in the service process of government departments. Based on the concept of integration, the government departments can form a chain and finally form a complete service system network, so as to realize the rapid circulation of information, data and services from point to point and from chain to chain, break the information islands and improve the performance of government services. Wang (2016) built an intelligent service chain home-based elderly care model, which is composed of five modules, with a home-based elderly care demand module as the core. It is a collection of home-based elderly care service demands for the elderly in the community. Based on the basic information service module, the information

database of community elderly care service is established. With the intelligent elderly care service platform as the center, the elderly care service demands are uploaded to the platform through intelligent media, and then are uniformly conveyed to the service departments. Supported by the elderly care supply module and based on the data analysis results of the demand module, it can receive information from the elderly care platform and provide corresponding services. It develops the feedback supervision module, therefore the problems encountered will be timely given feedback.

2.3 Research review

In 1978, Dr. Edingtond. from the University of Michigan first put forward the concept of health management, which uses technology and management means integrating clinical medicine and preventive medicine to provide help for healthy people, sub-healthy people, high-risk people and sick people. By controlling the formation of disease status and risk factors, it reduces the disease incidence of healthy people, sub-healthy people and high-risk people, reduces the disease condition of sick people, reduces the incidence of complications, alleviates the burden of disease and improves the quality of life (Liao et al., 2019).

Many practices have been carried out for integrated health management services in and beyond China (Koperski, 2000; McKenzie et al., 2012; Pilzer, 2015), such as health management services in Germany, including preventive health care, disease diagnosis and treatment, mental health, drug management, dental care, and sports rehabilitation, so that prevention and medical services can be effectively integrated and connected to form integrated health management services (McKenzie et al., 2012). Japan has established a medical circle to ensure the accessibility and universality of comprehensive and integrated health management services such as basic medical care, nursing services, and health follow-up (Koperski, 2000). The general practitioners, nurses and social workers in the UK form an integrated health management service team to provide services for residents (Pilzer, 2015). China has explored integrated health management services applicable to China by implementing a tiered diagnosis and treatment system, forming urban medical alliances, county close-knit medical consortiums and specialty alliances, and carrying out family doctor contracting services, but there are still problems such as fragmented health management content and service processes, imperfect operation mechanisms and evaluation mechanisms, inadequate health management services, "signing without an appointment" by family doctors, difficulty in achieving the primary treatment at the community level, and low trust among residents. The existing research on

integrated health management has failed to establish a suitable theoretical framework; the integrated health management service model suitable for the framework of a close-knit medical consortium needs to be explored urgently; and the evaluation of integrated health management service capacity and related effects need to be further studied.

Service Chain Theory believes that service institutions are closely connected with each other like a "chain" which can promote the improvement of service efficiency and service quality (Hu & Ning, 2003). The leading medical institutions of the close-knit medical consortium and the node institutions such as township health centers and village clinics form "nodes" (institutions) in the chain of "service guarantee"- "service guidance"- "service provision"- "service evaluation", and each "node" institution provides closely connected corresponding key link services, so as to form an efficient and integrated health management service model. Service Chain Theory provides a feasible theoretical framework for the research on the integrated health management model of the close-knit medical consortium (Liu & Yin, 2011). The integrated health management of the close-knit medical consortium from the perspective of the service chain includes service guarantee links (such as policy supply, medical insurance payment, and regional information construction), service guidance links (such as medical service technical guidance, medical equipment, and personnel training provided by leading hospitals for primary medical institutions), service provision links (prevention, control, diagnosis and treatment, rehabilitation integration) and feedback evaluation links in the later stage of services, which can realize the benign linkage between service model analysis and effect evaluation, and provide decision support for the construction of integrated health management model of the close-knit medical consortium.

Based on the Service Chain Theory, this study will construct an integrated health management service model of the close-knit medical consortium, design an index system to comprehensively evaluate the integrated health management service capacity in Jiangsu pilot areas, take the key populations of chronic diseases as the starting point to evaluate the implementation effect of integrated health management of the close-knit medical consortium, and propose optimal countermeasures. The research results can provide a new theoretical basis for the practical innovation of the "Healthy China Strategy" and have important practical significance and application value for promoting the construction of a close-knit medical consortium, effectively implementing the tiered diagnosis and treatment system, and realizing the integrated development of primary prevention, treatment and management.

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Chapter 3: Theoretical Framework of Integrated Health Management Service Model of Close-knit Medical Consortium

3.1 Overview of Service Chain Theory

3.1.1 Definition of the service chain

With the vigorous development of manufacturing in the last century, Service Chain Theory appeared in the research of manufacturing management (Schers et al., 2006). Since the end of the last century, with the great improvement of material life, consumers' needs have become diversified and unpredictable (Christakis et al., 2003). In the traditional industrial chain, enterprises need to control the supply of raw materials, manufacturing and sales and many other links. With the expansion of the scale of enterprises and the increase of market demand, it is difficult to adjust, and flexibility is poor in the lengthy chain. Once the market demand is adjusted, it will deal a fatal blow to the enterprise. In order to cope with similar situations, a large number of enterprises began to enhance their core competitiveness, only responsible for a certain link in the industrial chain such as supply, manufacturing, wholesale, and retail. Enterprises sought cooperation with each other, and the period reconstituted the service chain of a certain industry. Since then, the idea of a new service chain has been promoted and has become a new mode of operation for enterprises (Lambert et al., 1998).

However, the concept of the service chain is still not clearly defined in management. Hu and Ning (2003) believe that the service chain is based on modern science and technology (modern information technology, logistics technology, and system engineering), from the perspective of meeting consumer needs to the greatest extent and organizing the relevant service institutions, individuals, technologies and other components in a certain way, to finally form a service network.

Ken (2005) believes that the service chain should be formed when the service provider is unable to meet the needs of consumers. It is necessary to split the needs of consumers, and at the same time send requests to other service providers, corresponding to each link in consumer demand, and the service providers respond one by one. The cooperation between different service providers constitutes a supply chain relationship, called the service chain. Waart and

Kremper (2004) believes that the formation of the service chain should be divided and defined according to after-sales service. The division of after-sales service is divided into raw material supply, sales, distribution, maintenance and other activities, and the resulting service supply process is called the service chain. Hao et al. (2005) defined the service chain from the meso-level and believed that the service chain should be a network chain structure composed of suppliers, manufacturers, service providers and consumers based on the time sequence of service generation by controlling the changes influencing factors such as logistics, information flow and capital flow around products and services.

After reviewing different definitions of service chains by Chinese and foreign scholars, this thesis summarizes five common definitions of service chains through literature analysis (Anderson & Morrice, 2010; Cook et al., 2001; Ellram et al., 2004), as shown in Table 3.1.

Table 3.1 Five definition perspectives of the service chain

Definition perspectives of the service chain	Specific definition of the service chain
Based on the principal relationship in the service industry	The service chain is a reflection of the supply and demand relationship among different service subjects in an industry.
Around the service production process	The service chain is a service process that divides services from production to service output to customers in order to meet customers' needs.
Application of product chain theory in the service industry	The service chain refers to the management of the supply chain in a certain industry, so as to manage service-related products.
From the perspective of product servitization	The service chain is a series of service activities in the process of product servitization.
Based on enterprise procurement services and product services	The service chain refers to the information management, process management, capability management, service performance and capital management that occur from supplier to customer in professional services.

Based on the definition from the above five perspectives, the service chain refers to a service supply chain formed by relevant organizations involved in service through certain service processes in order to meet the needs of service objects (Sampson & Scott, 2000). The integrated health management service chain discussed in this thesis refers to the service chain that provides health services for residents and does not involve the physical products related to the health service process, such as the supply and demand relationship of drugs.

3.1.2 Service chain model

According to the above summary of the definition of service chain, the component elements of service chain are mainly composed of relevant institutions providing various services to consumers, which cover finance, insurance, government services, information management,

consultation and other fields according to different service contents (Qi & Zong et al., 2006). From a certain field, multiple service chains in the field form a service system, and each service chain in the service system contains "nodes" that meet the requirements of its own "chain". These service organizations form "nodes" on the "chain", and each "node" on the "chain" provides consumers with the services they need.

According to the formation and characteristics of the service chain (Hou et al., 2020), the constituent elements of the service chain are mainly divided into: 1, "Nodes", which are the basic elements that make up the service chain, and represent the providers who provide services for consumers. 2. "Chain", which refers to the connection between "nodes" and "nodes", that is, the correlation among various service providers. In the entire process of service provision, there must be some kind of connection among the service organizations, but the relevant intensity is different, otherwise, a complete service chain will not be formed. 3. The "service concept" that governs the entire service chain. A complete service chain requires a unified service concept throughout the entire service process. Only under the guidance of a unified concept, can the providers in the service process improve their business level and service quality to ensure the normal and benign operation of the service chain.

According to the classification of the service chain model in existing studies, it can be divided into three parts: pre-service, mid-service and post-service. Pre-service refers to the services involved by customers before purchasing products, including information consultation, consumption guidance, and policy services. Mid-service refers to the services involved in the purchase and use of products by customers, including capital, insurance, technology, and maintenance services. Post-service refers to the services provided by relevant organizations when customers' needs are not met and problems arise, including product upgrade services, transfer and recovery services.

3.1.3 Influencing factors of the service chain

3.1.3.1 The influence of policies

The supporting policies of the regional government have a direct impact on the formation and development of the regional service chain. Generally speaking, strong policy support and a loose policy environment are conducive to the formation of all lines of the service chain, and a large amount of capital inflow is conducive to the improvement of all links in the service chain. The loose policy environment is conducive to the formation of healthy competition and further promotes the optimization and reorganization of the service chain. In addition, relevant policy

incentives can also give positive stimulation to the service chain, such as the research and development of innovative technology, and service chain system innovation.

3.1.3.2 The influence of regional advantages

Regional advantage mainly refers to the improvement of infrastructure in the region, including good infrastructure construction such as transportation, logistics, communication, education and medical care, which has a potential impact on the service chain. Good transportation and logistics facilities can greatly improve the service efficiency of the service chain. Good communication facilities can ensure the timely transmission of information between nodes in the service chain. In addition, each link in the service chain will obtain a lot of useful information, which helps to reduce the cost of information exchange between "nodes" on the chain. Good education and medical facilities are conducive to absorbing all kinds of talents and elites, providing fresh vitality for all links in the service chain, and indirectly promoting the development of the service chain.

3.1.3.3 The influence of human resources

The influence of human resources is mainly reflected in the technological innovation and management innovation relying on universities and scientific research institutions. "Science and technology are the primary productive force". Only by relying on the development of modern technology, can the development of the service chain make great progress. On the other hand, the degree of a strategic reserve of talents is also an influencing factor for the core competitiveness of the service chain. According to the development experience of developed countries, after the development and popularization of education and science and technology reach a certain scale, a high level of social civilization can be produced, and without this general law, the development of the service chain and even the economic development of the entire region will lack motivation and vitality.

3.1.3.4 The influence of regional industrial planning

Regional industrial planning can affect the long-term development of the service chain of various industries. Only by formulating industrial development goals according to the actual situation of each region and local conditions, can a benign environment be provided for the construction and development of the service chain of various industries. According to the characteristics of a region, the region that relies on light and heavy industries and natural resources can not only promote the rapid development of the original industries, but also develop new economic growth points by strengthening the development of the service industry.

To sum up, compared with the traditional industrial operation mode, the service chain covers the following main ideas (Bonora, 2002). 1. System concept: each institution involved in the service process does not exist independently, but as part of the "service chain", and the correlation among each other makes it an organic whole. 2. Common vision: each organization in the service process aims to meet the needs of consumers and maximize its own interests. 3. Cooperation and win-win relationship among various institutions: from the perspective of the service supply side, each institution changes the original competitive relationship and chooses to cooperate vertically in the service chain; from the perspective of the service demand side, all institutions in the service chain cooperate with each other to jointly cope with market competition. 4. Highlighting the core competitiveness and complementing each other's advantages: each institution in the service chain gives full play to its own advantages, highlights its service characteristics, and looks for cooperation partners suitable for each other to complement each other and create a service chain with overall competitiveness.

3.2 Overview of the health management service chain

3.2.1 Concept of health management service chain

With the continuous development and improvement of the Service Chain Theory, scholars have only begun to study the health management service chain in recent years (Essila, 2017). Since the definition of service chain is not clear, different scholars have different definitions of health management service chain. Some scholars believe that the health management service chain is a special service chain from the perspective of the demand side, and that the service process of this service chain originates from the demander and eventually flows to the demander. From the perspective of value medicine, some scholars believe that the essence of the health management service chain is to create demand-oriented value, and through the integration of all health service resources, the final chain structure is composed of health service institutions.

The health service chain is centered on the demand side, with the core content of realizing patients' needs and coordinating and optimizing the entire health services. Based on the above factors, this study defines the health management service chain as follows: a health management service consortium established by the decision-making institutions (upper-and lower-level medical institutions) related to health services according to a certain organizational structure and starting from meeting the needs of patients.

3.2.2 Connotation of the health management service chain

According to the definition of health management service chain, the connotation of health management service chain is summarized as follows.

(1) The health management service chain is composed of several medical institutions. Due to the gap in the service capacity of medical institutions at all levels, lower-level medical institutions do not have the professional advantages and authority of upper-level medical institutions, and upper-level medical institutions do not have the convenience of contacting patients at any time. On this basis, a health management service connection emerges. In the service process, medical institutions at all levels complement each other's advantages, and the upper- and lower-medical institutions cooperate with each other to provide continuous, timely and professional health management services for patients and residents.

(2) The health management service chain is a continuous service process. The key to the implementation of continuous services lies in the two-way referral system, in which rehabilitation and health care services are transferred down to lower-level medical institutions and medical treatment services are transferred up to upper-level medical institutions according to patients' needs. According to the ability and role of each institution in the health service chain, service allocation is carried out, so as to achieve the overall optimization of the medical service chain.

(3) The health management service chain involves various elements such as capital flow, information flow and service capacity flow. Capital flow is mainly supported by the government and compensated by medical insurance fund. Information flow mainly includes physical examination information, medical treatment information, examination information and rehabilitation information of patients. Service ability flow mainly includes the management ability, medical technology ability and service quality of medical institutions, which will affect all levels of medical institutions in the health management service chain.

Taking the close-knit county medical consortium as an example, this study combines with Service Chain Theory to propose the basic model of health management for the close-knit county medical consortium, as shown in Figure 3.1. According to the types of services provided by the medical consortium to residents, the health management service chain model is mainly divided into three stages: pre-service, mid-service and post-service. Pre-services are the preparations required by medical institutions before providing health services, including the formulation of long-term goals of medical institutions in the entire region, relevant supporting policy support, financial and medical insurance fund guarantees, and the degree of

informatization construction. Mid-services refer to the services needed by residents in purchasing health management services, including different types of services for different groups of people (health promotion, health management, and disease management), medical community services, and collaboration among tertiary medical institutions. Post-services are the "after-sales" services provided by relevant medical institutions or government departments when health services fail to meet the health needs of residents or problems arise, including optimization of product services, improvement of service quality, and strengthening of supervision and management. In the service chain, there should be strict correspondence between the medical consortium and the health services it provides. Service Chain Theory holds that when a medical consortium forms a "chain" around a specific health service, its service efficiency and service quality can be greatly improved.
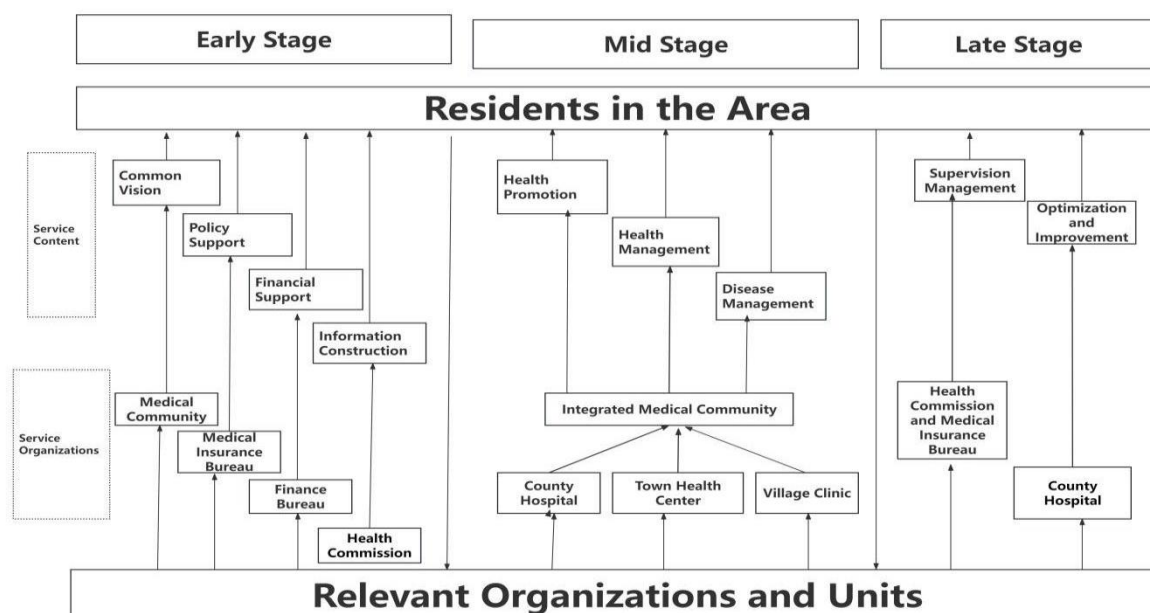
Figure 3.1 Basic model of health management service chain of close-knit medical consortium

3.3 Applicability of Service Chain Theory in the field of integrated health management services

3.3.1 The traditional "one-stop" medical service model is neither economical nor realistic

The so-called "one-stop" medical services in this study mean that most of the medical service needs of patients can be provided by a single medical institution.

First of all, secondary and tertiary medical institutions cannot bear the medical "crowding" of a large number of patients due to their size and the limited number of medical personnel, and primary medical institutions are also difficult to meet patients' demands for health services due to their technical limitations. From the perspective of functional positioning of medical institutions at all levels, tertiary medical institutions provide treatment for difficult and miscellaneous diseases, while community health service centers, township hospitals or village clinics and other primary medical institutions can only provide primary health care and basic medical services. It can be seen that the service content provided by health service institutions at all levels is not the same, but in the form of complementary services to ensure the health needs of patients.

Secondly, from the perspective of affordability and resource allocation of health services, the "one-stop" health service model is not feasible. A large number of patients flock to tertiary medical institutions for treatment, which will greatly increase the medical burden on patients. In addition, a large number of patients and their families seeking medical treatment in different places also increase the cost, resulting in poverty due to illness and other phenomena. As for medical institutions, high-level medical institutions incur higher medical costs, and the loss of patients in primary medical institutions also leads to a serious waste of medical resources.

3.3.2 High-quality and efficient health services require a "chain" delivery model

In order to solve the problems of the "one-stop" health service model, some scholars beyond China have found that the health services provided by medical institutions at all levels have complementary characteristics, and proposed the concept of multi-institution integrated service, shifting the perspective to ensure the continuity of health services through the process of providing health services (Catty et al., 2013; Cook et al., 2001; Hansen et al., 2013).

Saultz (2003) proposed a hierarchical concept. In order to ensure the continuity of health services, three conditions must be met, namely, continuity at the information level, continuity between patients and institutions, and continuity between patients and doctors. Doctors can achieve continuity at the information level by understanding and grasping the patient's medical information and health status to provide effective information for follow-up services; patient-institution continuity refers to the continuous relationship established by patients who visit the same medical institution for a long time due to the familiarity between institutions and patients; patient-doctor continuity is based on the first two kinds of continuity, and the doctor-patient relationship has been fully established in terms of responsibility and trust (Jha et al., 2007).

Continuous health service is a prominent feature of the health service chain. A large number of foreign literature studies have pointed out that continuous health services have positive effects on improving the quality of health services. 1. Improve the efficiency of health services. The long-established relationship of trust and responsibility between patients and doctors, as well as the doctor's familiarity with the patient, can effectively reduce the time to visit the doctor and the number of tests. 2. Effectively reduce the incidence of chronic diseases. Through continuous health service guidance, the incidence of chronic diseases has been significantly improved among young and middle-aged people. 3. Reduce the death rate from chronic diseases. Continuous health services can effectively reduce the mortality rate of various chronic diseases. 4. Reduce the disease economic burden on patients. Continuous health services can effectively reduce the disease economic burden on patients with cardiovascular and cerebrovascular diseases, hypertension and diabetes (Mondor et al., 2017).

In summary, this study believes that based on the perspective of Service Chain Theory, the framework of integrated health management services is as follows:

1. The starting point is "people-oriented" health management services. The "People-oriented" concept means that health service institutions should provide safe, high-quality, convenient and economical services.

2. From the perspective of health management service providers, the construction of the health service chain should be "health-oriented". Vertical institutional integration should be realized among health service providers at different levels, and horizontal service integration with complementary advantages should be realized among health service providers at the same level. Finally, a network structure is formed.

3. In the aspect of service flow of health management services, this study believes that the integration-oriented policy, finance and information construction are the basis for the construction of the health management service model. It is the premise of building the health management service model to create business guidance and exchange at the county and township levels, which is oriented by the homogenization of health management services. The core of building the health management service model is to provide continuous health management service oriented by enhancing the multi-level linkage in the medical consortium. The internal and external supervision and assessment of the medical consortium oriented by quality improvement is the starting point for building a health management service model.

Therefore, based on the Service Chain Theory, this study will construct a theoretical framework of the integrated health management service model from three stages and four

dimensions: pre-service (service guarantee), mid-service (service guidance, service provision), and post-service (service assessment).

3.4 Construction of the theoretical model of integrated health management of the close-knit medical consortium based on Service Chain Theory

Based on the general model of Service Chain Theory proposed by Baltacioglu et al. (2007), the theoretical model of integrated health management of the close-knit medical consortium mainly includes three stages of service supply, service delivery, service utilization and four key levels: service guarantee, service guidance, service provision and service evaluation, as shown in Figure 3.2. Service guarantee is provided by government agencies with policy, financial and other support, which is the premise of service provision; service guidance is carried out by leading hospitals, aiming to carry out technical guidance, training and exchanges with primary medical institutions, which is the basis for improving the service level of primary medical institutions and realizing the sinking of high-quality medical resources. Service provision is jointly provided by the member units of the medical consortium, which integrates prevention, diagnosis and treatment, nursing and rehabilitation, and occupies the main position; service evaluation is mainly supervised and evaluated by government agencies, service users and leading hospitals, with the purpose of timely discovering health management service provision problems, controlling the quality of health management services, optimizing the health management service process, and finally realizing the sustainable development of the model. These four levels interact and complement each other.
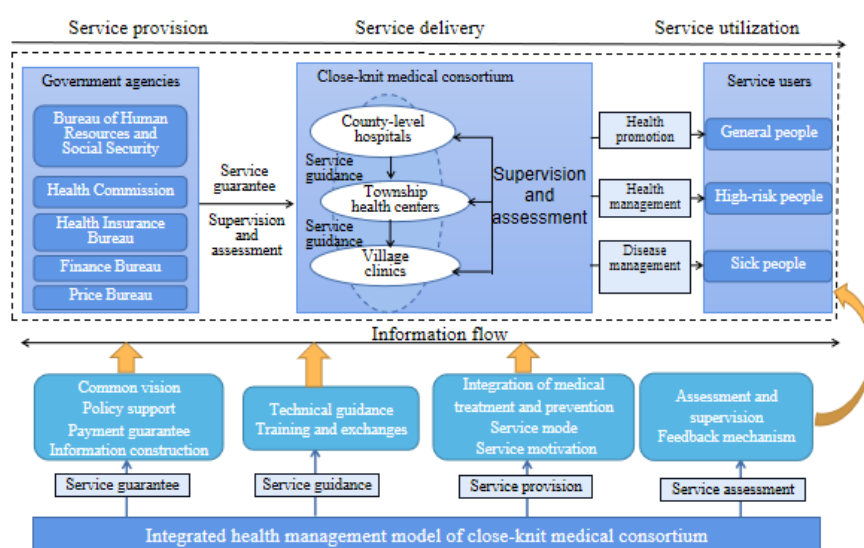
Figure 3.2 Theoretical model of integrated health management of close-knit medical consortium from the perspective of Service Chain Theory

3.4.1 Pre-service - the guarantee mechanism of integrated health management services

First, establish a common vision for integrated health management services. Integrated health management services should have the basic characteristics of the whole population and the whole life cycle of health management, as well as continuous, comprehensive and personalized health services. Based on these characteristics, the medical consortium should adhere to the common concept of "people-centered", integrate the internal services of the medical consortium (health promotion, disease prevention, treatment, rehabilitation, and nursing), and provide continuous, comprehensive and personalized health management services covering the whole life cycle for the residents within the jurisdiction of the medical consortium.

Second, improve policy support for integrated health management services. The upper-level government should reasonably delegate power so that the medical consortium has certain policy-making power to propose practical and operable policy plans according to local conditions, which is also conducive to the effective implementation of policies. Upper-level governments can establish effective regulatory mechanisms to protect the rights and interests of various organizations by formulating a list of responsibilities.

Third, develop service-integrated-oriented medical resource allocation measures. The allocation of resources within the medical consortium should be guided by service integration, and the funds of county and village medical institutions should be integrated. For example, funds supported by the government, regular budget allocations, special public health funds and medical insurance funds should be integrated and redistributed to different degrees, so as to improve the efficiency of fund use.

Finally, build a digital and information platform to realize integrated health management services throughout the whole cycle of life. By improving the health data platform (electronic health records, electronic medical records, and mobile medical equipment), the informatization level of health management within the medical consortium is improved. The interconnection of health data can be truly built by unifying the degree of data standardization of various information platforms within the medical consortium, realizing the integration of multi-source heterogeneous health data, and breaking down data barriers between institutions or departments at all levels, thus providing favorable guarantees for the overall promotion of the integration of health management services.
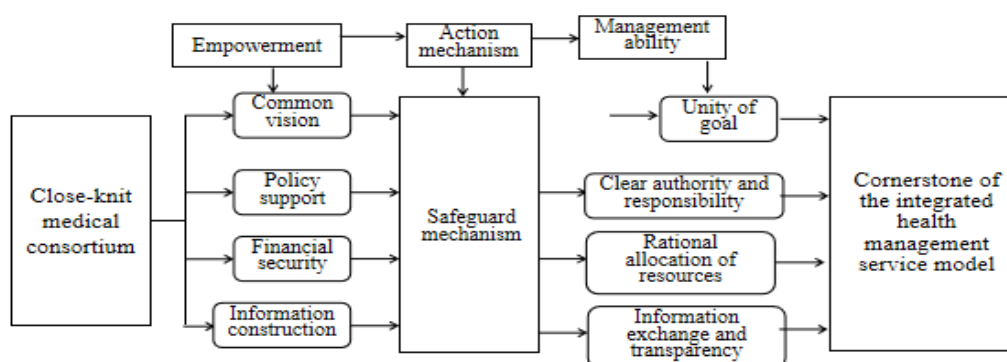
Figure 3.3 Guarantee mechanism of integrated health management services

Therefore, in the health management services of this study, service guarantee is the premise of integrated health management, which is in the service supply stage, as shown in Figure 3.3. At this level, government agencies, as "meta-nodes" in the service chain, assume the main responsibility and play the role of policy support and planning guidance at the top level. The guaranteed services provided by the government mainly include policy support, payment guarantee, information construction, and promotion of a common vision. Policy support is a key element in promoting integrated health management. The implementation of integrated health management of the close-knit medical consortium involves multiple government departments, such as the Medical Insurance Bureau, the Health Commission, the Finance Bureau, and the Human Resources and Social Security Bureau, which requires coordination in the policy system among government departments, so as to clarify the role positioning and division of labor of different functional departments of the government, and timely communicate, solve and improve the irrationality in the promotion of the policy of the close-knit medical consortium in practical work. In terms of payment guarantee, the role of medical insurance fund incentives and constraints should be given full play, and the close-knit medical consortium should be guided to implement integrated health management services. For example, medical insurance uses the principle of "total payment, remaining balances, and reasonable sharing of overspending" to guide medical staff to make reasonable diagnoses and treatments, reduce excessive medical treatment and induction demands, and encourage members of the medical consortium to improve the health status of county residents by integrating health management services, so as to realize efficient utilization of medical insurance funds. In addition, the government should provide appropriate financial subsidies at the initial stage of the implementation of integrated health management to reduce the initial profit loss brought by the reform to the medical consortium.

Building a regional information sharing platform within the county medical consortium is a basic project to realize integrated health management. The information platform plays the role of integrating health resources in the medical consortium and is also a tool for regulatory agencies to achieve real-time evaluation and supervision, which can effectively improve the efficiency of integrated health management services of the medical consortium. The common vision is the goal-oriented integration of health management. The nodes of the close-knit medical consortium in the integrated health management service chain need to break the benefit barriers, take improving the health level of county residents as the common goal, and provide a high-quality, efficient, convenient and continuous health management service set.

3.4.2 Mid-service - the collaboration mechanism and linkage mechanism of integrated health management services

3.4.2.1 Collaboration mechanisms to promote the homogenization of health management services at the county and township levels

The orderly development of tiered diagnosis and treatment depends to a certain extent on the homogeneity of health services within the medical consortium. That is, the treatment of common diseases within the county medical consortium can provide patients with the same quality of health services at all levels of medical institutions, and on this basis, patients can be effectively guided to receive treatment in the order of "major diseases at the county level, minor diseases at the primary level, and rehabilitation in the community".

In order to achieve homogeneous health services at all levels, it is necessary to start from two aspects: first of all, the county hospitals should establish an internal support system of the medical consortium, regularly train the personnel of the lower-level medical institutions, regularly evaluate the training content, and formulate training objectives. In addition, experts from county hospitals should carry out joint consultations on a regular basis, ward rounds and other educational activities at all levels of the medical consortium. Secondly, member units at township health centers and village clinics should establish a training feedback mechanism, clarify their positioning in the process of health management, and propose practical assistance and training content.

3.4.2.2 Linkage mechanisms to promote the continuity of health management services at the county and township levels

In order to enhance the linkage of health management services in the medical consortium, the medical consortium should clarify the functional positioning of institutions at all levels, establish a clear referral system, and implement incentive measures for channeling high-quality medical resources to the community level.

Due to differences in functional positioning, institutional scale, service capacity, audience and other factors, county and township medical institutions within the medical consortium should be committed to the provision of basic medical services and basic public health services, and carry out medical services for common diseases, chronic diseases and other diseases. As the leading units of the medical consortium, county-level medical institutions should focus on the treatment of routine difficult and miscellaneous diseases and undertake third- and fourth-level surgeries in the county. In order to avoid the "siphon effect" of leading medical institutions in the county, a reasonable tiered diagnosis and treatment system should be established to improve the primary treatment rate at the community level, refine the referral process, and truly achieve the goal of the medical consortium.

Channeling medical and health resources and human resources to the community level should be carried out reasonably according to local conditions. Combined with the optimization of the salary compensation mechanism and aimed at improving work enthusiasm, the medical staff in the leading hospital should be prepared for long-term flow and improve the quality of medical care. Staff performance assessment should be quantified, so that the experts can be flowed within the medical consortium. Training and exchanges should be comprehensively promoted to promote the homogeneous training and management of personnel within the medical consortium and improve the diagnosis and treatment skills of primary doctors.
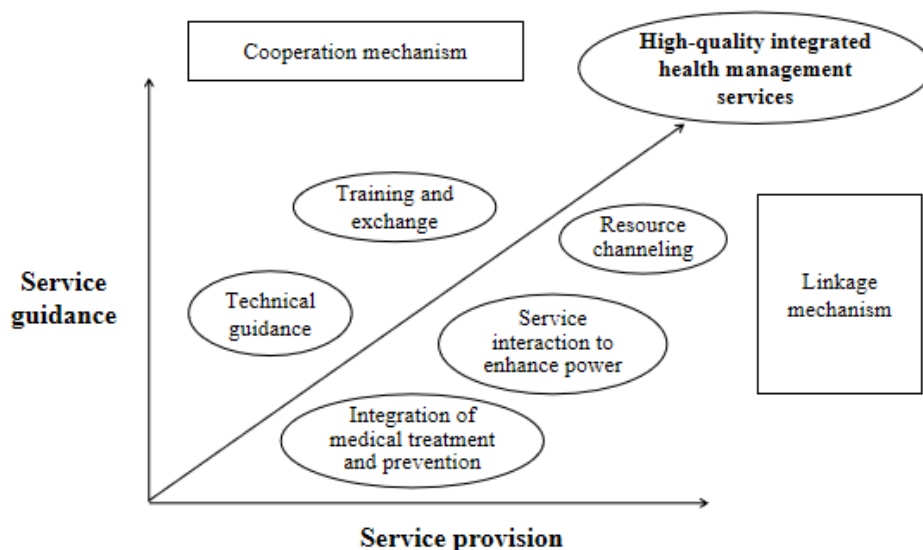
Figure 3.4 Collaboration mechanism and linkage mechanism of integrated health management service model

Combined with the above analysis, the health management service guidance of the close-knit medical consortium serves s the guarantee for the development of high-quality integrated health management services. As shown in Figure 3.4, the development of high-quality integrated health management services not only requires coordination of exchanges and cooperation and business guidance among personnel at all levels of institutions, but also requires continuous health services brought by the linkage of institutions at all levels. Service guidance is in the service delivery link of the service chain. Primary medical institutions often find it difficult to assume the role of "health gatekeepers" for county residents, mainly because of the insufficient technical ability of primary medical staff. In order to effectively improve the technical ability level of primary medical staff, leading hospitals should conduct business guidance and training interaction with township hospitals and village clinics and lead the formation of an integrated health management service team. Specifically, through the guidance of health management services, it can strengthen the linkage between counties and townships and promote the channeling of high-quality medical resources. First of all, county hospitals dispatch administrative personnel and professional and technical personnel to improve the professional level of medical institutions at the community level, optimize the medical service delivery process, and enhance the primary health service capacity through business guidance. The methods that can be taken include counterpart assistance to primary medical institutions, long-term stationing or regular visits for clinical assistance, lecture training, teaching rounds, and promoting appropriate technologies and strengthening the construction of specialties. Also, the medical staff at primary medical institutions can also go to leading hospitals for further

study, forming a good interaction among professional and technical personnel. In addition to medical services, it is also necessary to optimize and coordinate the public health resources of the medical consortium and organize public health professional groups to guide the medical institutions at the community level to better implement public health service projects.

The provision and utilization of health management services is the main part of the integrated health management model, and it is in the service delivery and service utilization stage of the service chain. At present, the "disease-centered" service model makes it difficult to meet the other service needs of residents, which requires the close-knit medical consortium to change the service concept and effectively implement the integration of medical and prevention services. Therefore, it is necessary to integrate services such as health promotion, prevention, diagnosis and treatment, rehabilitation, and nursing within the medical consortium. Service integration often involves effective coordination among multiple levels and organizations. To this end, county, township and village medical institutions should first clarify their respective responsibilities: county hospitals mainly provide treatment services for difficult diseases and critical diseases; township health centers mainly provide basic medical services to treat common diseases; village clinics mainly provide basic public health services, thus finally realizing the integrated management among different institutions, and providing residents with continuous services such as two-way referral, expert registration, pre-hospital examination and post-illness follow-up. In addition, on the basis of institutional collaboration, the integration of different professionals should be achieved to build a health management service team with general practitioners as the core and other types of health workers, including county-level specialists, public health physicians and nurses, to jointly provide county residents with an integrated, continuous, efficient and high-quality service set of prevention, control, diagnosis and treatment, nursing and rehabilitation. In this way, it can help to promote the effective integration of health promotion, health management and disease management at the primary level, build a reasonable and orderly medical treatment order, and finally realize the rational utilization of health management services by people (general, high-risk and sick people) with different health conditions.

In order to effectively stimulate the power of different professional medical personnel in the county and rural medical institutions to cooperate and provide services, the incentive and salary distribution system should be established within the close-knit medical consortium to promote integrated health management. In addition, the medical insurance uses the principle of "total payment and remaining balances" is adopted, which can also play an effective incentive and restraint role for medical staff.

3.4.3 Post-service - the supervision and assessment mechanism of integrated health management services

It is important to strengthen the internal and external supervision and assessment mechanism of the county medical consortium. Health management service evaluation is an important guarantee for the sustainable development of integrated health management in the close-knit medical consortium. First of all, government agencies need to strengthen the supervision and assessment of the close-knit medical consortium, establish a scientific and standard assessment index system, and directly link the assessment results with the amount of medical insurance payment, the total amount of performance-based payment and hospital awards. Secondly, a scientific and reasonable performance appraisal system should be established within the medical consortium, with leading hospitals responsible for assessment and supervision. The assessment indicators are guided by residents' health outcomes, and the assessment results are linked to the salaries and titles of medical staff. Thirdly, the close-knit medical consortium needs to further improve the service strategy and service process based on the actual needs of county residents and the feedback on health management services.

3.5 Summary

By summarizing the development and application of Service Chain Theory, this chapter has applied Service Chain Theory to the field of health management services, and then proposed the basic concept of a health management service chain, that is, a health management service consortium established by the decision-making institutions (upper- and lower-level medical institutions) related to health services according to a certain organizational structure and starting from meeting the needs of patients.

On this basis, combining the influential factors of the service chain and the basic characteristics of the health management service chain, a theoretical model of integrated health management services based on the close-knit medical consortium was proposed. Based on the general model of Service Chain Theory proposed by Baltacioglu, this study believes that the health management model of the close-knit medical consortium mainly includes three stages of service supply, service delivery and service utilization, and four key levels of service guarantee, service guidance, service provision and service evaluation. This study also believes that in the health management service model of the close-knit medical consortium, the integration-oriented policy, finance and information construction are the basis for the construction of the

health management service model. It is the premise of building the health management service model to create business guidance and exchange at the county and township levels, which is oriented by the homogenization of health management services. The core of building the health management service model is to provide continuous health management service oriented by enhancing the multi-level linkage in the medical consortium. The internal and external supervision and assessment of the medical consortium oriented by quality improvement is the starting point for building a health management service model.

Chapter 4: Research Method

4.1 Research Design

This study employs a comprehensive approach to investigate the integrated health management service model within a close-knit medical consortium. The design integrates various research methods to ensure a thorough examination of the research questions. The combination of qualitative and quantitative methods provides a robust framework for understanding the complexities of the service model.

4.2 Data Collection Methods

4.2.1 Literature research

With "health management" and "medical consortium" as keywords and through the retrieval and systematic sorting of literature in and beyond China, government documents, laws, regulations and other relevant information on health management and medical consortium, theories, models, experiences and methods for reference are extracted, providing theoretical support for the construction of the theoretical framework of health management services and medical consortium from the perspective of tiered diagnosis and treatment.

4.2.2 Analysis of typical cases

By sorting out the exploration and practice of integrated health management of the close-knit medical consortium in Binhai County, its practice path, construction results and problems in the development process can be explored. A theoretical model framework was built based on the Service Chain Theory. Through in-depth interviews with key figures, the key driving factors and operation process of the integrated health management model of the close-knit medical consortium were analyzed, and the interlinkage was realized among health management service guarantee, health management service guidance, health management service provision and utilization, health management service power and service evaluation, thus forming a close-knit service network chain structure, influencing and supervising each other, promoting the construction and development of the integrated health management service model of the close-

knit medical consortium, and providing reference and basis for the construction of the integrated health management evaluation index system of close-knit medical consortium.

4.2.3 Expert consultation

Based on the theoretical framework constructed by literature research, and through collection and collation, a pool of integrated health management evaluation indicators of the close-knit medical consortium was preliminarily constructed. The index pool contains four dimensions, namely service guarantee, service guidance, service supply and service evaluation, including 11 second-level indicators and 58 third-level indicators.

In this study, experts engaged in hospital management, health management, public health and other fields were selected as the consultation objects. A total of 15 experts from 10 universities and cities in Jiangsu, Zhejiang, Anhui, Sichuan, Guangdong, Shandong, Henan and other provinces and cities were selected. Most of the experts have a doctor's degree, and more than 90% of them have the title of associate high senior or above. Most of them have worked in related fields for more than 10 years. After two rounds of expert consultation, the evaluation indicators of the integrated health management ability and effect of the close-knit medical consortium were further screened, which were gradually unified with the expert opinions, to form the final evaluation index system. The consultation objects include experts from the Health Association, heads of health management departments, medical administration and medical management leaders of health departments, and experts and scholars engaged in health management teaching and research in colleges and universities.

1. Analysis of expert enthusiasm

Expert enthusiasm refers to the degree of attention and participation of experts involved in consultation, which is generally shown by the enthusiasm coefficient (Wang, 2011). The enthusiasm coefficient is calculated as the ratio of the number of experts participating in the consultation to the number of all experts. Studies have shown that the enthusiasm coefficient should not be lower than 0.50: usually, it is good to be higher than 0.70, and above 0.80 indicates a high level of enthusiasm.

2. Analysis of expert authority degree

The expert authority degree (Cr) (Chen, 2012) is represented by the expert authority coefficient, which is calculated as Cr= (Ca + Cb) / 2. Ca indicates the expert's judgment basis, and Cb indicates the expert's familiarity with the field. The above data can be obtained through the first round of expert consultation questionnaires. The judgment basis assignment table can

calculate the judgment basis score of an expert, and the specific assignment table is shown in Table 4.1.

Table 4.1 Expert judgment basis assignment table

Judgment basis	The degree of influence on judgment		
	Large	Middle	Small
Theoretical analysis	0.3	0.2	0.1
Practical experience	0.5	0.4	0.2
References in and beyond China	0.15	0.05	0.05
Intuitive judgment	0.05	0.05	0.05

Expert familiarity is divided into five levels, which are very familiar, relatively familiar, generally familiar, less familiar and unfamiliar, and the specific scores of different levels are shown in Table 4.2. Studies have shown that if the expert authority coefficient > 0.7, the reliability of consultation is better (Vidal et al., 2011).

Table 4.2 Expert familiarity assignment table

Familiarity	Very familiar	Relatively familiar	Generally familiar	Less familiar	Unfamiliar
Score	1.00	0.80	0.60	0.40	0.20

3. Analysis of expert coordination degree

The expert opinion concordance coefficient, also known as Kendall's W concordance coefficient, is generally expressed by w, with a coefficient between 0 and 1. The closer the coefficient is to 1, the higher the consensus of experts' opinions (Wang, 2011). The Chi-square test ($P < 0.05$) of the W-value of the importance, operability and effectiveness of expert consultation has statistical significance, and the W-value of the importance and operability are both > 0.3, indicating that the coordination of expert consultation is good.

4.2.4 Questionnaire design

4.2.4.1 Interview Questionnaire Design

In recent years, in order to better meet the health service needs of residents and provide residents with higher level and better quality of basic medical services, China has issued a series of documents to promote the construction of the medical consortium, and the policy system of county medical consortium has been initially established. In 2019, the National Health Commission and the Administration of Traditional Chinese Medicine issued the *Notice on Promoting the Construction of a County Close-knit Medical Consortium*, listing 24 counties in Jiangsu Province as pilot counties of the county close-knit medical consortium. As a pilot area, Binhai County actively explored the construction of a close-knit medical consortium, realized the effective connection of the four levels of service-guarantee, guidance, provision and

evaluation-through the integration of health management services, and achieved the integration of the internal management system, operation mechanism and assessment and evaluation of the medical consortium under the leadership of the government. The institutions of the medical consortium worked together to provide health management services for residents under a common vision.

Based on multiple investigations, this study designed semi-structured interview questionnaires for different interview subjects, including the interview questionnaire for the evaluation of integrated health management services of the close-knit medical consortium, the interview questionnaire for the heads of integrated medical institutions of the close-knit medical consortium, the interview questionnaire for the heads of primary medical institutions of the non-close-knit medical consortium, and the interview questionnaire for the heads of the health management team at the county, township, and village levels, to conduct field research on the construction of the close-knit medical consortium in Binhai County. In-depth interviews were conducted with key insiders such as the president of Binhai County People's Hospital, the chiefs of the science and education section of county hospitals, the heads of the health management department of county hospitals, the leaders of the health management team of county hospitals, the president of Caiqiao Health Center, the medical staff of Caiqiao Health Center and village doctors, to obtain detailed materials on the health management model of the close-knit medical consortium in Binhai County, and to analyze the key driving factors and operation process of the integrated health management model from the perspective of Service Chain Theory on the basis of in-depth understanding of the practical process of the construction of the close-knit medical consortium in Binhai County, thus providing a factual basis for the case analysis.

4.2.4.2 Questionnaire on health index of patients with chronic diseases

The self-designed "Health Index Questionnaire for Patients with Chronic Diseases" was used to conduct questionnaire surveys on two different groups: the effect group and the control group. The questionnaire included patients' personal information (basic information, health status, health behavior, health service utilization, medical expenditure, health management), chronic disease self-efficacy scale (SECD6) and chronic disease resource survey scale (CIRS) and quality of life scale (EQ-VAS). In addition, patients with diabetes also need to fill in the diabetes knowledge scale (ADKnowl), diabetes problem scale (PAID), diabetes self-management behavior scale (SDSCA), and diabetes quality of life scale (D-QoL or EQ-VAS). Hypertension

patients also need to fill in the self-management behavior scale (HPSMBRS) f and quality of life scale (QLICD-HY). Each of the scales is described as follows:

1. EQ-VAS

This study used EQ-VAS to investigate the overall health status of patients with chronic diseases (diabetes and hypertension). The scale is part of the European Qualityof Life-5 dimensions (EQ-5D) developed by the European Society for Quality of Life. It is a reliable measurement tool, which is easy to use and widely used for the measurement of quality of life. The composition of this scale and the application of Chinese versions have been extensively studied and demonstrated for reliability and effectiveness (Li & Luo, 2009; Tian et al., 2007; Xing & Ma, 2013a, 2013b). The VAS score ranges from 0 (worst healthy state) to 100 (completely healthy state), and the higher the score, the better the quality of life (Greiner et al., 2005; Pickard et al., 2012; Shaw et al., 2005).

2. SECD6

The Center for Patient Education Research at Stanford University has developed a self-efficacy scale. There are six items in total, and the score range of each item is 1-10. Patients with high scores have a high degree of confidence in behavioral ability. Items 1-4 and 5-6 measure "symptom management self-efficacy" and "disease commonality management self-efficacy" respectively. The higher the average score, the higher the level of self-efficacy. An average score of ≥ 7 indicates a greater likelihood of completing a task or performing a certain action, whereas a score of < 7 indicates the opposite (Lorig et al., 2001).

3. CIRS

Glasgow et al. (2000) developed CIRS to assess multiple social resource support for chronic disease management based on a social-ecological theory model. Social support refers to the information, emotion and tangible support perceived by patients with chronic diseases from family and friends, community and doctors (Glasgow et al., 2000). The initial version has 65 items and also there is a short version composed by 29 items. After the 2005 revision of the scale, seven dimensions of support (22 items) are measured, including support from individuals, family and friends, and healthcare teams. A 5-point Likert scale is used, and the higher the average score is, the more support it receives. In this study, the revised Chinese version of the CIRS subscale for doctors, family and friends and community was used to evaluate social support.

4. PAID

The scale is used to assess patients' diabetes-related fear, depression and other emotions, using a 5- point Likert scale. The score level of each item is "0-4". The higher the score, the

more serious the psychological pain of the patients. The total score range is 0-80 points. The higher the score of the patients with greater psychological pressure, the more serious the psychological pain caused by diabetes (Huang et al., 2010).

5. ADKnowl

This scale is used to measure patients' awareness and understanding of diabetes and its management information (Zhu, 2010). It is highly recognized internationally and has the advantages of strong pertinence, simplicity and comprehensiveness. After the Chinese version was revised and adopted by Chinese scholars, the accuracy rate was used to measure the knowledge level of patients in this study. The higher the accuracy rate, the higher the knowledge level of diabetes. Eight items are covered: (1) Diet / food; (2) Treatment; (3) Diseased items; (4) Foot care; (5) Physical exercise; (6) Influence items of smoking and drinking; (7) Reduce the risk of complications; (8) Hypoglycemic items. For each item, the options are "right", "wrong", and "don't know" (score for "right", no score for "wrong" or "don't know").

6. SDSCA

Developed by Toobert and Glasgow in 1994 and revised several times, this scale has been validated by a large number of studies as one of the few scale tools that can satisfy comprehensive psychometric assessment, which is currently the most widely used diabetes self-management behavior scale in and beyond China. Through a refined design of no more than 11 items covering diet, exercise, self-glucose monitoring, medication compliance, and foot care, the culturally refined Chinese scale will be used in this study (Hua & Zhu, 2014). The answer level of the questions in the scale was divided into "0-7" points, with one reverse score item and 10 positive score items. The situation is reflected by the average score, and those who score high manage themselves well.

7. D-QoL

This scale was first developed in the 1980s and has been optimized and revised by relevant studies in many countries to comprehensively evaluate the adaptive status of patients with type 2 diabetes. The Chinese version of the scale has 4 dimensions (27 items), and the measurement results are based on linear scores. Those with high scores have a poor quality of life. In order to facilitate the comparison of different dimensions, the ratio (score value/number of items in each dimension * 100%) is used (Zhang, 2005).

8. HPSMBRS

This scale has good reliability and validity and is used to measure the self-management level of patients. The frequency of daily behaviors of hypertensive patients is assigned 1-5 points, with the total score ranging from 33 to 165. The higher the score, the better the self-

management level of patients (Zhao & Liu, 2012).

9. QLICD-HY

This scale is used to measure the quality of life of hypertensive patients. It has good reliability, validity, responsiveness and feasibility. It includes positive items and reverses items. The positive items count 1-5 points directly, and the reversed items count the reverse points. Each dimension is reflected by the sum of the scores of items within the dimension. The higher the score of the total volume, the better the life quality of patients (Wan et al., 2013).

4.3 Data Collection Procedures

4.3.1 Survey objects

In this study, Binhai County of Jiangsu Province was selected as a typical case to analyze the integrated health management service model of the close-knit medical consortium. Based on the theoretical model framework, the exploration and practice of integrated health management service of the close-knit medical consortium in Binhai County were analyzed. In-depth interviews were conducted with the county Health Commission, leaders of the Medical Insurance Bureau, leading hospitals of the medical consortium, leaders of associated medical institutions, leaders of health management service institutions and members of the service team, and key insiders of the linkage of health management services.

In terms of the evaluation of the service capability of providers, eight close-knit medical consortiums were selected as research samples from the 24 pilot counties (cities and districts) in Jiangsu Province listed in the *List of Pilot Provinces and Pilot Counties for the Construction of County Lose-knit Medical Consortium* issued by the National Health Commission in 2019 according to their geographical location, economic development level and research needs, including three in southern Jiangsu, two in central Jiangsu and three in northern Jiangsu. An evaluation index system was established from the four dimensions of service guarantee, service guidance, service provision and service evaluation. Based on the comprehensive evaluation index system of integrated health management service ability, field investigation and empirical study were conducted on the collaboration, service integration degree and service integration ability of sample member units and family doctor teams in chronic disease health management.

In terms of the evaluation of the demand-side service effect, the integrated health management service models of the close-knit medical consortium in Binhai County People's Hospital and Caiqiao Township Health Center were taken as the effect group, and Zhenghong

Township Health Center adjacent to its geographical location but not within the framework of the close-knit medical consortium was taken as the control group, to conduct a questionnaire survey on patients with diabetic nuclear hypertension. The sample was selected based on the national health physical examination data and medical service record database of Binhai County, and cluster sampling was adopted to investigate the health management service demands, health behaviors, risk factors, and diseases and health monitoring indicators of key chronic disease populations (diabetes, hypertension). The comprehensive effects of the basic information, health status, health behavior, health service utilization, medical expenses, health management, chronic disease self-efficacy, chronic disease resources survey, diabetes and hypertension self-management, quality of life and other factors were evaluated (the questionnaire is shown in Annex E). A total of 3424 questionnaires were collected, including 2193 questionnaires from patients with diabetes. The effective questionnaires were 2023, with an effective rate of 92.25%. 955 questionnaires were collected from the effect group and 1068 from the control group. There were 2622 questionnaires for hypertension patients, with 2252 effective questionnaires, an effective rate of 85.89%, 1147 in the effect group and 1105 in the control group.

4.3.2 Interviewers training

Interviewers needed to receive training in informed consent, questionnaire structure and content, inquiry methods, standardized filling, and others, and have good investigation skills and a rigorous work attitude. In the field questionnaire survey, the interviewers must conducted the survey in strict accordance with the training content and shall not arbitrarily change the survey conent and survey objects, to ensure accurate and complete information and avoid measurement bias. Before the formal survey, the interviewers should conduct a simulation survey to help them better understand the questionnaire.

4.3.3 Questionnaire quality control

All the recovered answers were inspected to see if there were any missing items. Unqualified questionnaires were removed, and professional personnel carried out strict data deletion, data coding and data entry, and checked the input data to ensure the authenticity and accuracy of the data.

4.4 Evaluation Index System

4.4.1 Evaluation index system of integrated health management service of close-knit medical consortium

Based on the theoretical framework of the integrated health management service model of the close-knit medical consortium under the Service Chain Theory, the "comprehensive evaluation index system of the integrated health management service ability of close-knit medical consortium" was constructed. Through a comprehensive review of the literature and relevant policy documents related to the close-knit medical consortium in and beyond China, and combined with the interview materials of the sample close-knit medical consortium, the evaluation index pool was first determined after internal discussion of the focus group in strict compliance with the principles of systematicness, importance, scientific and representativeness in the designation of indicators. After two rounds of expert consultation, the integrated health management evaluation index system of the close-knit medical consortium was established, including four first-level indicators, 11 second-level indicators and 50 third-level indicators (see Annex F: Table F.1). Finally, the weight value of the indicators was determined to carry out an evaluation on each sample institution.

4.4.2 Assignment of health index variables for patients with chronic diseases

Based on the review of the theory and empirical literature of diabetes and hypertension self-management behavior in and beyond China and combined with the classification of influencing factors of chronic disease prevention and control at the World Bank, the core elements and variables of the questionnaire are designed, and the specific variable indicators and scales are shown in Annex F: Table F.2 and Annex F: Table F.3.

4.5 Data Analysis Methods

4.5.1 Analytic Hierarchy process

The analytic hierarchy process (AHP) is a kind of research method which combines the characteristics of qualitative and quantitative methods. It is widely used for decision-making dealing with complex problems. Its basic principles are: decompose the problem into several elements, divide all elements into several levels according to their dependencies, and form an orderly hierarchical model; evaluate these elements from high to low by comparing the importance of each element to the importance of higher-level elements; list the judgment matrix from the importance evaluation results of each level, calculate the maximum feature vector of

the matrix to reveal the degree of contribution of the lower factors to the higher factors, and obtain the weighted value of each basic element relative to its target thing (Xie et al., 2022).

In this study, the 1-9 scale method was adopted to make a pairwise comparison of the importance of indicators. Based on the comparison results, the corresponding judgment matrix was constructed. Finally, the weights of the first, second and third level indicators were calculated according to the results of the judgment matrix. The specific operation is shown below:

(1) Construct a multi-level analysis structure. Integrated health management of the close-knit medical consortium is the evaluation goal, which is at the highest level; the composition of the integrated health management evaluation index system of the close-knit medical consortium can be divided into four dimensions: service guarantee, service guidance, service provision and service evaluation. Then the dimensions at this level are refined to lower levels. Figure 4.1 shows an analysis structure with multiple levels.
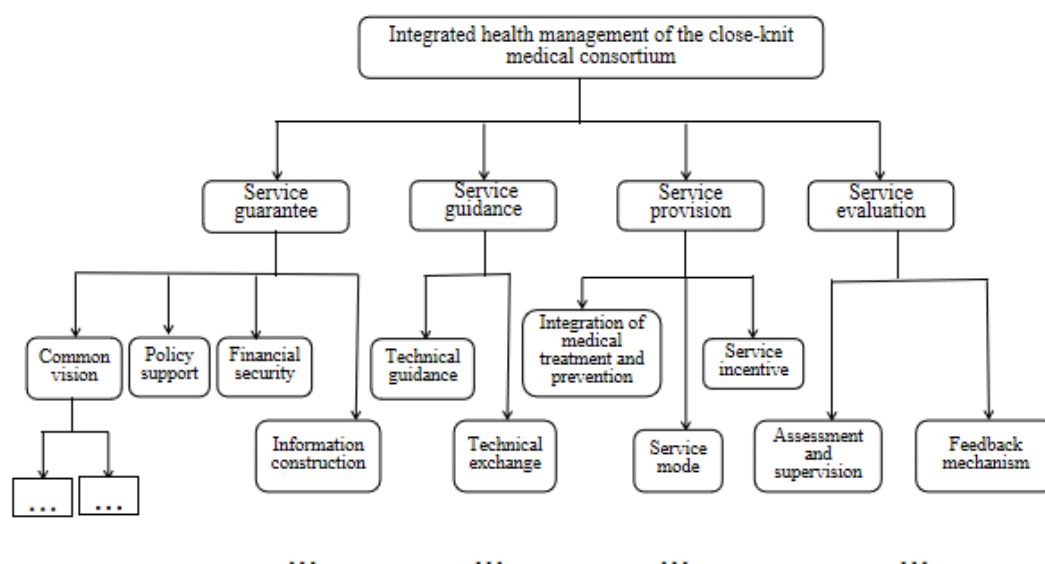
Figure 4.1 Hierarchical model of integrated health management evaluation of the close-knit medical consortium

(2) Construct a judgment matrix. The importance of each indicator is scored using the numbers 1 to 9 and their reciprocals, and the corresponding weighting scale is collected. The specific meanings of the numbers are shown in Table 4.3. In the evaluation system composed of multiple indicators, the importance of index i and index j is compared with the previous dimension, and a judgment matrix is constructed according to the comparison results, that is, A = (aij) n + n. There are a total of 16 judgment matrices in this study.

Table 4.3 Meanings of importance scales

Importance scales	Meaning
1	Indicate that the two indicators are of equal importance
3	Indicate that the indicator on the left is slightly more important than the indicator on the top
5	Indicate that the indicator on the left is obviously more important than the indicator on the top
7	Indicate that the indicator on the left is strongly more important than the indicator on the top
9	Indicate that the indicator on the left is extremely more important than the indicator on the top
2,4,6,8	Represent the mean value of the above judgments
Reciprocal	If the ratio of the importance of element i to element j is Aij, then the ratio of the importance of element j to element i is 1/Aij

(3) Calculate the result. Through expert consultation, the 1-9 scale method was used to compare the importance of indicators in pairs. According to the comparison results, the corresponding judgment matrix was constructed. The software sorted out the judgment matrix and calculated the weight of indicators to obtain the weight of each indicator. The CI (consistency indicator) value of each indicator should be less than 0.10, and the indicators that do not meet this condition need to be corrected. In this case, it is necessary to ensure that there is no logical omission in the priority order of the indicators, and that the weight obtained by calculation can be accepted.

(4) For instance, consider an expert's evaluation of the assessment matrix for indicators (Table 4.4 and Table 4.5):

Table 4.4 Expert's Evaluation of the Assessment Matrix for Level 1 Indicators

	Service Guarantee	Service Guidance	Service Delivery	Service Evaluation
Service Guarantee	1	1/3	1/4	1
Service Guidance	3	1	1/2	3
Service Delivery	4	2	1	3
Service Evaluation	1	1/3	1/3	1
SUM	9	3.66	2.08	8

Table 4.5 Judgment Matrix Weights

	Service Guarantee	Service Guidance	Service Delivery	Service Evaluation	W	Aw
Service Guarantee	0.11	0.09	0.12	0.125	0.1111	0.45
Service Guidance	0.33	0.27	0.24	0.375	0.3042	1.23
Service Delivery	0.44	0.55	0.48	0.375	0.4642	1.88
Service Evaluation	0.11	0.09	0.16	0.125	0.1205	0.49

Based on the formula，and the definition of eigenvalue $\mathbf{Aw} = \lambda \mathbf{A}$ (matrix*eigenvalue = eigenvector*matrix), Find the largest eigenvalue λ = （0.45/0.1111+1.23/0.3042+1.88/0.4642+0.49/0.1205）/4=4.0458

By analogy, the sorting weight of each judgment matrix is calculated to obtain the judgment

matrix of each expert. The arithmetic average is used to determine the sorting weight of all the experts, completing the data set. Finally, the total sorting weight is calculated using the sorting weight of the judgment matrix after the set of weights.

4.5.2 Weighted Rank-Sum Ratio (WRSR)

In 1988, the rank-sum ratio (RSR) was proposed by the famous statistician Professor Tian Fengqiao (Tian, 2002). RSR is a nonparametric research method, which has the characteristics of parameter estimation and non-parametric statistics. In the field of health, it is often used to measure the rank average of rows and columns in a data table, and this method requires that the data have a continuous change between 0 and 1. In practice, the higher the RSR value, the better the overall performance of people who are assessed. WRSR combines RSR with the weights of evaluation indicators, and unlike RSR, it takes into account the importance of individual evaluation indicators (Xie, 2022). WRSR has no specific requirements for the data being analyzed and is widely used. It skillfully combines classical parameter estimation with modern non-parametric statistical methods, which is flexible and simple, and the analysis results are more accurate and reliable. WRSR successfully rules out interference caused by index outliers during the evaluation process, using rank scores as the unit of calculation (Tian, 2002).

In this study, each index value of each research object is ranked according to the requirements of WRSR. Indicators are generally divided into three types: high-excellent indicators, medium-excellent indicators and low-excellent indicators, and different types of indicators adopt different ranking methods. In the range of 1 to n, the minimum value of the high-excellent indicators is assigned to 1, and the maximum value of the low-excellent indicators is assigned to 1.

According to the rank of each indicator of the close-knit medical consortium, the WRSR value of each close-knit medical consortium is calculated as follows:

$$WRSR_i = \frac{1}{n}\sum_{j=1}^{m} W_j R_{ij}$$, where $i \in \{1, 2, \ldots\ldots, n\}$; $j = \in \{1, 2, \ldots\ldots, m\}$; Rij represents the rank of the jth indicator of the ith close-knit medical consortium; Wj represents the weight of the jth indicator, $\sum_{j=1}^{m} W_j = 1$. In this study, the value of WRSR represents the ability and level of integrated health management of the subjects.

The frequency distribution table of WRSR at the level of integrated health management in the close-knit medical consortium is listed, and the frequency (f), cumulative frequency (Σf),

rank (R), average rank (' R) and downward cumulative frequency (P= 'R/n) of WRSR in each group are calculated. P is converted into the value of Probit, namely the corresponding standard normal deviation u+5. Statistical software SPSS25.0 is used to conduct linear regression analysis with Probit as the independent variable and WRSR as the dependent variable, which shows that there is a linear correlation between WRSR and Probit. WRSR values of each close-knit medical consortium are put into the regression equation to obtain their respective estimates of WRSR.

4.5.3 Statistical analysis

Data was input through epidata3.0, and relevant estimation software such as Excel2010 and stata16.0 was comprehensively used for data integration and analysis.

1. Descriptive statistics

Descriptive statistics were made on the demographic characteristics, chronic diseases, and physical and mental health of the respondents. The chronic disease comorbidities, health knowledge level, social support, and frequency, content and mode of integrated health management follow-up services of patients with diabetes and hypertension in the effect group and control group were descriptively analyzed; the mean and standard deviation were used to describe the continuous variables; and the frequency and percentage were used to describe the categorical variables.

2. Hypothesis tests

Student's t-test was performed for the mean difference between the effect group and the control group for the continuous variables. The mean differences in diabetic diet, healthy diet, exercise, blood glucose monitoring, foot care, medication compliance and quality of life status in self-management behaviors of patients with hypertension were analyzed between the effect group and the control group.

3. Regression analysis

Ordinary least squares estimation method for linear regression analysis was performed for the factors affecting the self-management behavior and life quality of patients with chronic diseases. The effects of integrated health management services on self-management behavior and quality of life in people with chronic diseases were explored, the effects of integrated health management follow-up services on self-management behavior and quality of life in people with chronic diseases were analyzed, and the influencing factors and effects of self-management behavior and quality of life in the control group with chronic diseases were analyzed as well.

Chapter 5: Results

5.1 Case analysis of integrated health management services delivered by close-knit medical consortiums in Jiangsu Province from the perspective of Service Chain Theory

The establishment of county-level medical consortiums is an important breakthrough in promoting the tiered diagnosis and treatment system. It is an important part of the new round of deepening medical and health system reform, and a system innovation that helps adjust and optimize the structural design of medical and healthcare resources. The county-level medical consortium plays an important role in exploring China's integrated health management service system and serves as a key hub connecting primary-level healthcare institutions with high-quality county-level medical service resources.

Binhai County is one of the testing fields of the national close-knit medical consortium. In 2020, the government established a close-knit medical consortium service network with Binhai County People's Hospital as the leader, Caiqiao Township Health Center as the center, and village health offices as the basis. The government has optimized the allocation of medical and healthcare resources by implementing integrated management, a tiered diagnosis and treatment system, family doctor services, basic public health services, and health management services. It has also offered high-quality integrated health management services through the innovation and integration of health management service models and the internal and external communication mechanisms in the medical consortium.

This study analyzes the close-knit medical consortium in Binhai County, Jiangsu Province, to analyze the exploration and practice mechanism of integrated health management.

5.1.1 Case study subjects of the integrated health management model in close-knit medical consortium

According to the *Guiding Opinions on Promoting the Construction and Development of Medical Consortiums*, China will promote the construction of county-level medical consortiums and establish an integrated medical service system with grid-based management at county, touwnship, and village-level (Li et al., 2019; Zhang et al., 2019). In the *Outline of the*

Plan of "Healthy China 2030", health management has been mentioned several times. It puts forward that the government should "put health in all policies", "transform the service models and build an integrated health management service system" (The State Council, 2019). It also emphasizes that China should improve healthcare service quality by strengthening interdepartmental communications and collaborations.

Located in Yancheng City, Jiangsu Province, Binhai County consists of 12 towns, one farm and one saltern with a registered population of 1.2 million. Binhai County is close to the core cities of the Yangtze River Delta area, such as Shanghai, Nanjing, and Hangzhou. For a long time, it faced the problem of patient outflow and increased pressure on the medical insurance fund expenditures. To reduce the unreasonable cost of expenditure, the county has adopted a healthcare support system by sending experts working for the county hospital to deliver healthcare services in the subordinate hospitals, so as to improve the medical service quality at primary health institutions and attract patients to the grassroots hospitals. Nevertheless, the measure bore little fruit.

According to the *Notice on Promoting the Construction of Close-knit Medical Consortiums* released in 2019, the construction of close-knit medical consortium was piloted in Binhai County, and the government took the opportunity to construct a new round of medical consortium construction. Before it started, the Binhai County government made lots of preparations. It has conducted theoretical studies many times and sent officials to visit Youxi County of Fujian Province and Tianchang County of Anhui Province to conduct field research and draw on the practice of other medical consortiums, so that they could make suitable policies for Binhai County.

In 2020, the government of Binhai County established a pilot unit of the close-knit medical consortium with Binhai County People's Hospital as the leader and Caiqiao Township Health Center with intermediate service quality as the center. An integrated management model is implemented among hospitals to ensure shared services, responsibilities, management and interests and prepare for future application of the model in other areas. The permanent residents of Binhai County consist of a large number of seniors and people with chronic diseases. Most people visiting the hospital are suffering from common diseases, but only a small proportion of them obtain professional medical help from primary healthcare institutions. Medical resources have not been effectively used. Based on the above characteristics, the county government tailored its policies to the local conditions and established a close-knit medical consortium with Binhai's characteristics. During the construction, the government adhered to a systematic way of thinking, cooperated with multiple departments, and implemented multiple measures in

several areas, creating a medical consortium with clear goals, tasks, and individual responsibilities. Now it has made progress in improving the service capacity of health institutions, the usage of health insurance funds within the county, and mass satisfaction. Through the integration of health management services, the government established a system concerning the guarantee, guidance, provision and evaluation of healthcare services, and ensured the integration of the internal management system, operation mechanism, and evaluation system in a medical consortium, in which all medical institutions cooperate to provide health management services for the public. To improve the health of residents, medical institutions should pay attention to both disease prevention and treatment. In this way, they can reduce prevalence rates and reduce the outflow of health insurance funds, making possible the inflow of patients, encouraging them to visit grassroots hospitals, and integrating the medical service systems in Binhai County (Xiong et al., 2020).

Leveraging the close-knit medical consortium, the county has created an effective integrated health management model, and people living in the county now enjoy integrated, all-around, and whole-cycle health services covering disease prevention, healthcare, disease treatment, rehabilitation, and health management. The services lay a solid foundation for the medical consortium in Binhai County to transform into a healthcare consortium The achievements in the county show that the integration of health management can advance the in-depth integration of medical services and public health services, deliver health examination services to more residents, offer services before and after the examination, and improve the "Binhai model" of comprehensive health management. It also further promoted the integration of the organization, system, and service in the medical consortium, ensuring real unity among medical institutions in the consortium.

5.1.2 Exploration of the integrated health management model in close-knit medical consortium

In exploring its integrated health management model, Binhai County focused on four main aspects of health management: service guarantee, service guidance, service delivery, and service motivation and evaluation. Several parties, including the government departments, members institutions of the medical consortium and county residents, engaged in the process. The government take the medical consortium as a platform for providing services and distributes medical service resources within the county in a fair manner. The consortium functions in a specialized and standardized way to provide treatment, prevention, healthcare, and rehabilitation services that meet residents' health service needs. The analysis of the

exploration is as follows.

5.1.2.1 Analysis of the construction of the integrated health management model in close-knit medical consortium

(1) Government-led top-level system design

In terms of policy and system construction, the Binhai County government leads the top-level system design, integrates the medical resources in the region, and provides guarantees for the construction of the consortium, including supportive policy, payment guarantee, information-sharing system, and a shared vision. By separating management and administration, the government provides a high level of autonomy in management for county-level hospitals, allowing them to conduct unified administration in personnel, finances, and materials. The construction of medical the consortium has been incorporated into the "14th Five-Year" Development Plan of Binhai County. A management committee of the medical consortium has been established by the official departments of Binhai County, including the government, the Organization Department, the Commission Office for Public Sector Reform, the Development and Reform Commission, the Human Resources and Social Security Bureau, the Finance Bureau, the Health Commission, the Health Insurance Bureau, and the unit institutions of the medical consortium. The management committee is responsible for planning the construction and ensuring investment.

In terms of financial guarantee, in order to ease the financial pressure on the leading hospital at the beginning of construction, the county government provides special funding. A relevant agreement was signed with the Health Insurance Bureau to make annual pre-allocation of health insurance funds according to the population in the region, and the overspending will be borne by the leading hospital. With the health insurance fund surplus retention system, the county government clarified the allocation of benefits to avoid discord in the consortium.

(2) Exploration of the integrated operation model

In terms of operation management, the government adheres to the principle of systematic thinking, takes coordinated action and multiple measures in various fields, and emphasizes setting up a close-knit medical consortium with clear goals, tasks, and responsibilities.

In terms of service guarantee, the medical consortium implements the tiered diagnosis and treatment system, and utilizes funds from medical insurance, public health, and performance to increase the primary treatment rate at the grassroots medical institutions. It implements the treatment system of "primary diagnosis by village clinics, referral by town-level hospitals, and guidance by the county hospital", so as to increase the primary treatment rate at grassroots

hospitals, promote the tiered diagnosis and treatment system, prevent people from visiting high-level hospitals for minor diseases, and avoid the outflow of medical insurance funds. The function of different medical institutions has been clarified. The leading hospitals focus on the treatment of major diseases, examining and receiving patients with complex and serious diseases from lower-level health institutions, and transferring patients who need rehabilitation services to lower-level hospitals. Township health centers focus on the treatment of minor diseases, such as common diseases and the diseases that occur frequently, providing routine treatment, rehabilitation and healthcare services, as well as regional public health services, and responding to public health emergencies. Village health offices focus on the prevention of diseases, are responsible for disease prevention, patient referral, chronic disease management and education, and provide family doctor services and resident health management services.

In terms of the information-sharing system, an integrated health management platform and telemedicine center have been established to realize "grassroots examination, county hospital diagnosis, and grassroots treatment", which greatly saves patients' time in seeking medical services and realizes equal quality of medical services in counties and towns. The county government also adopts electronic health records (EHRs), which makes "information sharing" across the county possible. The mutual recognition of examination, test and treatment results helps to reduce unnecessary examinations, thus releasing hospitals' burden. By integrating and connecting the information systems of medical treatment, medical insurance and pharmaceuticals, the government achieves real-time supervision and dynamic analysis.

(3) Leading hospitals channel quality medical resources to lower-level hospitals

Channeling high-quality resources to lower-level hospitals is the key to integrating health management models among the consortiums.

Sending the treatment team to lower-level hospitals. The leading hospital sends technical personnel such as backbone doctors, head nurses and clinical pharmacists to member institutions to take part in rotation programs, offering medical consultation, guiding ward inspections, reviewing prescriptions, and training medical personnel in towns and villages. As the leading hospital of the medical consortium, Binhai County People's Hospital bears the responsibility of guiding primary medical institutions. It took two measures to perform the duty: (1) the county hospital sent one medical doctor, one surgical doctor, one medical nurse and one surgical nurse to Caiqiao Township Health Center for a long term. They are responsible for managing wards and guiding the township doctors to standardize case records. (2) From Monday to Friday, the county hospital will send experts from different departments to deliver medical services to people in the town and offer lectures and training activities for township

medical staff.

Other resources are channeled to lower-level hospitals as the following: Both the government and the leading hospital will invest in the equipment of consortium members. Five auxiliary treatment centers, such as imaging and testing, will be established to achieve grassroots examination, county hospital diagnosis, and grassroots treatment. They will also set up a pharmacy of the medical consortium, distributing the most-used drugs to hospitals in towns and villages.

Enabling lower-level hospitals to treat more types of disease. Disease treatment catalogs will be developed, with one for the leading hospital containing 10 types of diseases, and one for other consortium members involving 30 types of diseases. Patient transferring catalogs will be formulated, and patients with one of the 13 types of diseases should be transferred to the leading hospital, and patients in the rehabilitation period with one of the 55 types of diseases should be transferred to other units. The leading hospital provides training on treating chronic diseases and common diseases and surgical treatment for member institutions. By channeling medical resources to lower-level hospitals, the consortium can effectively reduce residents' out-of-pocket expenditure and economic pressure on medical treatment.

(4) Improvement of healthcare services through health management

Medical consortium prioritizes the health of the residents, integrates disease prevention with medical treatment, and reduces the incidence of diseases, so that both the recipients and providers of medical services can benefit from the mechanism.

Based on the residents' health status, the consortium carries out tiered and classified management, and provides personalized services such as health checkups, follow-up visits and health education. It provides sound basic public health services and implements a flexible inter-hospital patient transfer mechanism, making full use of medical and public healthcare resources through targeted service devilry. Besides, it also observes the principle of early detection, diagnosis, and treatment, and accelerates to build an integrated health management service model that covers all residents and the whole life cycle.

To improve public health services, the consortium tries to change the treatment-centered service concept by sending professional health managers to provide relevant training and guidance for grassroots medical staff. Based on the construction of health management team, it also improves its regional capacity and level of disease prevention and control, so that residents can enjoy the medical services of the county hospital without travelling afar and the consortium, which consolidates the foundation of health management and disease prevention for residents (Wang et al., 2021).

(5) Effective monitoring and assessment system for sustainable development of the medical consortium

An effective supervision and assessment system can help the county medical consortium improve its efficiency of health management services integration, optimize its service quality continuously, and ensure a sustainable and sound development. In the construction of the Binhai County medical consortium, the county government has given the county hospital a high level of autonomy in management to further stimulate the innovation and development vitality of the consortium. The government's role has shifted from supervising hospitals before and during treatment to managing procedures after the treatment, with an emphasis on the efficiency and quality of the consortium's operation mechanism, the work allocation and team collaboration results, and the usage of health insurance funds. A workload-based salary assessment system has been established to break the traditional allocation model of "communal pot" (which means "equalitarian distribution") and increase the average income of township medical staff by over 30%. The leverage of medical insurance has also been given full play, and the surplus of medical insurance has been distributed among medical staff and hospitals following the allocation principle of "3:2:2:3" (30% to village medical staff, 20% to township medical staff, 20% to county hospitals, and 30 % to town medical institutions), so as to encourage medical staff to prioritize the health of residents and place equal emphasis on treatment and prevention, and promote the good use of medical insurance funds in the medical consortium.

5.1.2.2 Achievements of the integrated health management model in the Binhai County close-knit medical consortium

(1) Flexible inter-hospital patient referral to resolve the problem of "difficult access to medical treatment"

The Binhai County close-knit medical consortium aims to allocate healthcare tasks among medical institutions at different levels, with the leading hospital "treating major diseases", member institutions "treating minor diseases", and village clinics "preventing minor diseases". The consortium also implements the tiered diagnosis and treatment system, in which village and town hospitals deliver primary treatment, patients will be referred to town-level hospitals, and county-level hospital offer guidance, so as to prevent injecting major resources into treating minor diseases.

In terms of receiving patients, the consortium adheres to the principle that the leading hospital only admits referred patients from town-level hospitals, and the patients will be referred to the lower-level member institutions during the recovery period. As for patients who cannot

be treated by the consortium, the leading hospital will send them to the higher-level hospitals. In the first half of 2021, the number of patients received by the member institutions increased by 32.4% year-on-year, and the number of hospitalizations increased by 254.3%.

(2) Major medical resources allocation to resolve the problem of "expensive access to medical treatment"

By channeling three major resources to lower-level hospitals, the consortium ensures medical services of equal quality at member institutions. Targeted and professional healthcare services are delivered by a health management team involving specialists from county-level hospitals, general practitioners from town-level hospitals, family doctors, and public health doctors. The consortium also focuses on maintaining the health of residents instead of treating diseases and offers integrated healthcare services to meet their health needs. In the first half of 2021, member hospitals performed a total of 74 operations, with out-of-pocket expenditures accounting for only 14.6% of residents' hospitalization costs.

(3) Four healthcare services delivery to reduce the incidence of diseases.

Health check-up service. Free health check-up will be provided by health management service teams consisting of doctors from medical institutions at different levels, and medical staff will offer two prescriptions (medical treatment and health management prescriptions) when treating one disease. Health checkups have been delivered in the whole region, with a health abnormality tracking and management rate of 95% and a compliance rate of 85% or above.

Disease Screening Services. Based on the 49 clinics of famous doctors in the region, the consortium delivers disease screening and health assessment services, including screening for vascular disease, kidney disease, prostate cancer, and tumors.

Electronic health records. By adopting electronic health records, the consortium realizes the sharing of health information within the organization, mutually recognizes examination and test results, and offers medical and health services of equal quality in the region. It has a database of 46,466 electronic health records, with over 95% percent of the region's urban and rural residents having health records and a dynamic utilization rate of over 75%.

Health management services. By offering routine health checkups, follow-up visits, health guidance and other health management services, the consortium implements the tiered health management mechanism. Through delivering the four services, it observes the principle of early detection, diagnosis, and treatment, and accelerates the construction of a new system of health management services that covers all residents and the whole life cycle.

5.1.3 Case study: Key motivators of the integrated health management model in close-knit medical consortium

The study has conducted field research on the construction of the Binhai County close-knit medical consortium, and conducted in-depth interviews with leaders at different level, for example, the staff from Binhai County People's Hospital, including the president, the head of the Science and Education Department, the head of the Health Management Department, and the head of Health Management Team; the staff from Caiqiao Town Hospital, including the president and other medical personnel; and the doctors in the villages. By doing so, we obtained detailed information about the health management model of Binhai County close-knit medical consortium.
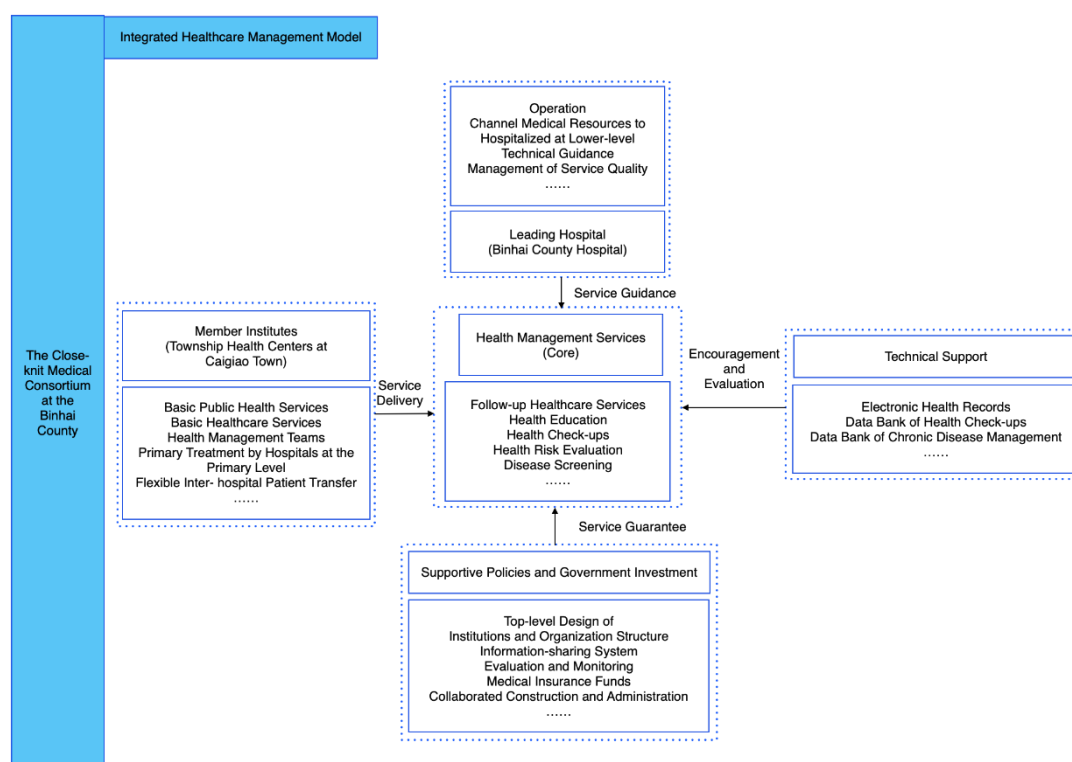
Figure 5.1 The integrated health management model of close-knit medical consortium in Binhai County from the perspective of Service Chain Theory

Based on the in-depth understanding of the practices of Binhai County close-knit medical consortium, we explored the key motivating factors and operation of the integrated health management model from the perspective of Service Chain Theory. We found four key motivating factors—health management service guarantee, health management service guidance, health management service delivery and utilization, and health management service motivation and service evaluation. The general framework is shown in Figure 5.1.

5.1.3.1 Health management service guarantee

In terms of the health management service guarantee, the Binhai County People's Government lead the top-level design and medical resources integration in the region, so as to separate management from service delivery, and delegate the county hospital management rights. The Caiqiao Health Center was renamed the Caiqiao Branch of the Binhai County Hospital, and its personnel and materials are managed by the county hospital. To guarantee the construction of the close-knit medical consortium, the government provides supportive policies, payment guarantees, information-sharing systems, and a shared vision. According to the president of Binhai County People's Hospital, "The construction of the medical consortium could not have been carried out smoothly without the participation, leadership, and the top-level design of the government. The government also lays down the standards for the consortium. In addition to documents and policies, we need the full participation of the government. The spontaneous and loose cooperation among medical institutions is not a real solution."

According to the contract signed by the medical consortium and the Medical Insurance Bureau, a certain amount of funds will be allocated to the consortium to cover the medical insurance expenses each year based on the total population of Caiqiao Town, and the overspending will be paid by the leading hospital. In order to ease the pressure on the leading hospital during the early stages of construction, the county government will provide special funding in the first three years. In an interview, the head of the science and education department of the county hospital said, "The county government allocates five million yuan to the consortium every year, and two million can be used to relieve the pressure in the first three years. However, the sum will decrease year by year, and there may be only one million and five thousand in the second year. Thus, the doctors within the medical consortium will have to increase the surplus of the medical insurance fund year by year, which in turn will mobilize the members of the medical consortium." The county people's hospital dedicated three million yuan to upgrade the infrastructure and equipment of the Caiqiao Health Center. The director said, "the improvement of equipment will enhance the primary medical service capacity and make it more convenient for residents to get medical services without travelling far."

As the basic project in medical consortium construction, the information-sharing system is the premise of resource integration within the medical consortium. It requires the government to invest a lot of financial and human resources. After the Caiqiao Health Center purchased a large amount of equipment, it built several telemedicine centers with the county hospital, including a teleconsultation center, a computed tomography imaging center, a pathology test

center and an electrocardiogram diagnosis center, realizing "grassroots examination, county hospital diagnosis, and grassroots treatment". Township doctors only need to send the examination results through the information system, and the diagnosis results of the county hospital will be sent back. It not only saves the time and energy of patients, but also ensures equal quality of medical and health services within the medical consortium. Meanwhile, repeated tests and the healthcare burden will be reduced through electronic health records, the sharing of information, mutual recognition of test results, and the promotion of a county-wide information network. Since the construction of the medical consortium, 46,466 health records have been uploaded, with 98.61% of the residents having health records and a dynamic utilization rate of 75.63%. According to the president of the county hospital, "Through the information-sharing system, we have realized the interconnection among the government, the health insurance bureau, and members of the medical consortium."

The surplus retention system of the medical insurance fund has to some extent allowed the members of the medical consortium to have a shared vision. The head of the science and education department of the county hospital said, "Every month we will assess the performance of the medical consortium, and the medical insurance funds surplus will be allocated following the principle of "3:2:2:3" (30% to village medical staff, 20% to township medical staff, 20% to county hospitals, and 30 % to town medical institutions), This system will push the members of the medical consortium to find ways to save more funds, as saving money for the people is to save money for themselves." The shared interests will reduce disagreements in the medical consortium.

5.1.3.2 Health management service guidance

Good grassroots hospitals are the key to integrating the health management model. As the leading hospital, Binhai County People's Hospital guides primary medical and health services, and channels high-quality medical resources to member institutions. The director of the Caiqiao Hospital said, "Personnel are the most fundamental resource of a hospital. Patients will visit hospitals with excellent doctors. At present, the most important goal is to improve the medical services in the center, as people are willing to visit medical institutions with outstanding services." To this end, the county hospital sends medical staff to the town hospital. First, it sends one medical doctor, one surgical doctor, one medical nurse and one surgical nurse to Caiqiao Township Health Center for a long term. They are responsible for managing wards and guiding the township doctors to standardize case records. If the town hospital is short of manpower, the county hospital will send more staff to support it. Second, from Monday to Friday, it sends

experts from different departments to deliver services to people in the town and offer lectures and training activities for township medical staff. In addition, under the guidance of the county hospital, Caiqiao Health Center resumes outpatient surgery, which has been suspended for eight years. The director of the town medical institution said, "The renovation of the operating room involves a lot of changes, including room layout, interior decoration, equipment purchase, and surgical staff training. Although the renovation has been delayed because of the pandemic, the result is satisfactory. Now, the operating room has the same equipment and strict management as the county hospital". From time to time, the county hospital dispatches experts from various departments, such as orthopedics, gynecology, and urology, to the countryside to carry out surgery in the Caiqiao Hospital, and they will train the grassroots medical staff. According to the medical staff of the Caiqiao Hospital, "After the medical reform, almost all the township health centers have suspended surgery, but after the establishment of the Caiqiao Branch, with the management of the county hospital, the surgery resumed, and the standards become stricter. We did not pay much attention to aseptic operations before, so patients might be infected after operations and need to take many antibiotics. Now the operation procedure is standardized, and infection rarely occurs, which is a big advantage compared with other township health centers."

The construction of the medical consortium attaches importance to the improvement of public health service. The director of the county hospital said, "Primary medical institutions directly deliver medical services to the public, and the grassroots medical institutions are ideal for providing health education." After receiving training and guidance from professional health managers, primary medical staff shifted their treatment concept from treatment-centered to prevention-centered. The village doctors said in the interview, "After the training, we have a deeper understanding of disease prevention, which helps us pass on the health-related knowledge to the residents." With the help of the county hospital, the medical services and public health services of Caiqiao Health Center have been significantly improved, allowing residents to enjoy the services at their doorstep, and laying a solid foundation for the provision of health management services.

5.1.3.3 Health management service delivery and utilization

Before the construction of the close-knit medical consortium, the Binhai County faced a serious outflow of health insurance funds—nearly half of the amount going outside the county. In order to address the problem, the medical consortium focuses on the health of the residents and emphasizes the importance of disease prevention, integrates medical treatment with prevention, so that the prevalence rate can be greatly reduced—a win-win situation for both the supply and

the demand of medical services. Therefore, the consortium established health management teams consisting of county-level specialists, town-level general doctors, rural doctors, and public health professionals to integrate prevention, treatment, rehabilitation, and health education, offering comprehensive health management services.

The head of the health management team said, "When establishing the team, we took into consideration the population structure, disease spectrum, people's lifestyle, and other factors. Now there are six teams serving 17 villages in Caiqiao Town. The multidisciplinary team includes physicians and public health staff from various departments of hospitals in the county, towns, and villages. Every member has a differentiated task and needs to identify patients as well as high-risk groups."

With clarified individual tasks, team members deliver integrated health management services in an efficient manner. The team leader said, "Professionals in different areas need to make full use of their expertise. Village doctors and public health workers are responsible for identifying target patients, carrying out household follow-up visits, and offering medication guidance and health promotion services for high-risk and sick people. They also bear the responsibilities of flexible referrals, health education, and policy promotion. Nursing staff assist family doctors in communicating with contracted residents and giving suggestions on their living habits. As the team leader, a county specialist, I'm responsible for providing guidance for and monitoring the quality of the team's services. Patients with complex conditions can directly visit the county specialists to save the referral process."

The health management team classifies the health status of the public and provides corresponding services according to the categories, avoiding the waste of resources due to repeated services. The details are shown in Figure 5.2 below. According to the team leader, "The team serves all kinds of groups, including the sick, high-risk, and healthy group. For sick people, we help to control the disease from getting worse and reduce the risk of complications. For high-risk people, we help to provide early diagnosis and treatment. For the healthy people, we can provide them with health education."

At present, 100% of families in Caiqiao Town have been registered with family doctors, 82.5% of which are under great attention. The health management team offers free physical examinations and provides prescriptions and health education according to the examination results, with a patient compliance rate of over 85%, and provides follow-up health management for people with abnormal health conditions. On this basis, the medical consortium has further clarified the functions of its members: the county-level "treating major diseases", the town-level "treating minor diseases", and the village-level "preventing minor diseases", so as to

implement a treatment system of "primary diagnosis by village clinics, referral by town-level hospitals, and guidance by the county hospital". Through the cooperation of medical personnel from different disciplines of medical institutions at various levels, Binhai County constructed an integrated health management model of "treatment and rehabilitation—prevention and healthcare—health management", so as to comprehensively meet the healthcare demands of all resident groups.
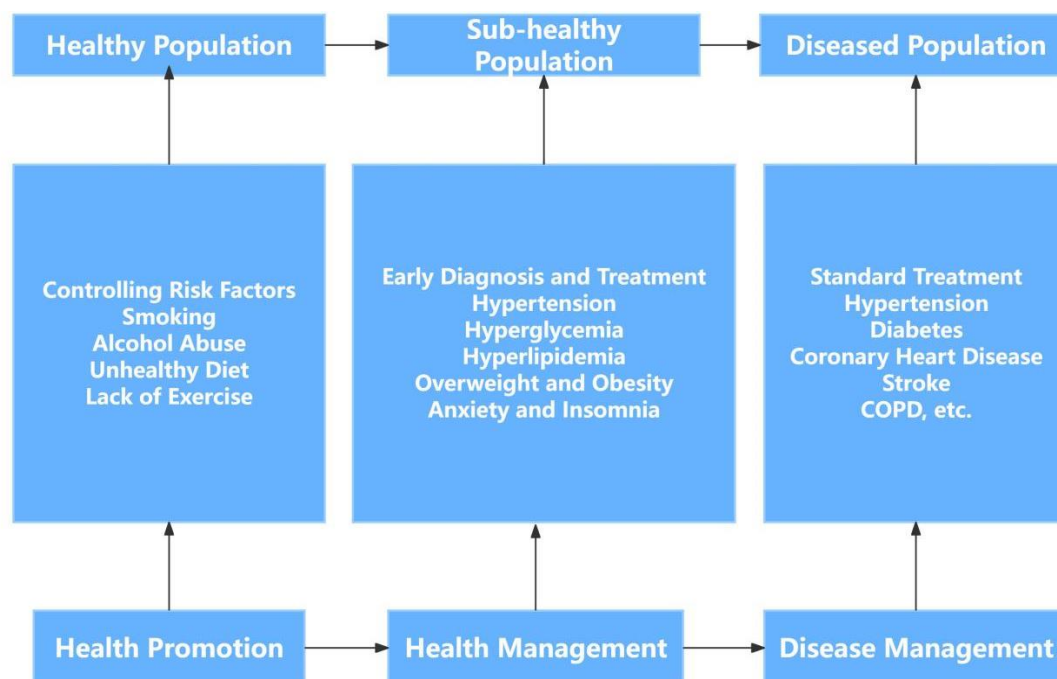
Figure 5.2 Service targets and main measures of the team

5.1.3.4 Health management services supervision and assessment

An effective supervision and assessment system helps to improve the medical consortium's efficiency in integrating health management services, continuously optimizing service quality, and supporting the sound development of the medical consortium. The system is shown in Figure 5.3.
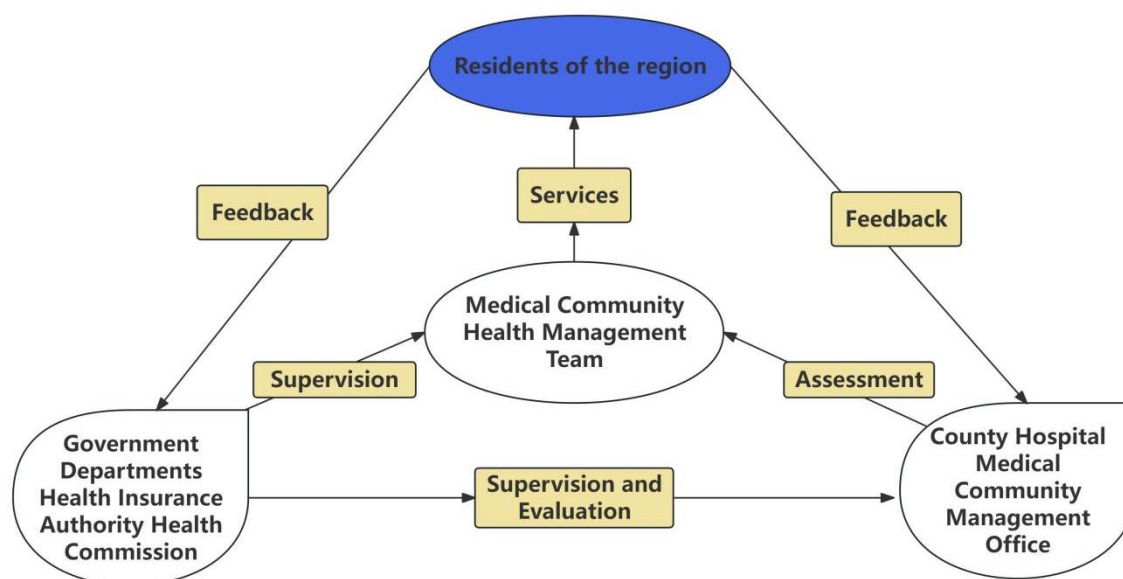
Figure 5.3 Supervision and assessment within and outside the Binhai County medical consortium

In the construction process of the Binhai County medical consortium, the county government has given the county hospital a high level of autonomy in management to further stimulate to further stimulate the innovation and development vitality in the consortium. The government's role has shifted from supervising hospitals before and during treatment to managing procedures after the treatment, with an emphasis on the efficiency and quality of the consortium's operation mechanism, the work allocation and team collaboration results, and the usage of health insurance funds.

Within the consortium, the county hospital conducts evaluation and supervision. In order to ensure that the health management team functions as expected and continues to play its role, the county hospital established a new department—the Health Management Department, to supervise and manage the health management team and perform quality control. The head of the Health Management Department said, "We intend to manage from the top down. In the medical consortium, the leading hospital controls the service quality of the health management teams. The consortium needs to improve the quality of primary healthcare, because most of the work is done by the township doctors, and the patients who can be treated by the township doctors will be transferred to the county doctors. In addition, the health manager has to follow up and evaluate the effect of health management carried out by the village doctors and offer suggestions for them to improve. The department will give an assessment to the doctors at town hospitals and village clinics once a month. As for the medical staff of the county hospital, subsidies will be granted to them to encourage them to offer guidance to doctor at lower-level institutions. Thus, for the time being, no assessment is conducted on them. Our assessment indicators include the effect of health management, the public health programs (except for

chronic diseases treatment), the integration of medical institutions at levels of county, town and village, and the awareness and satisfaction of residents. The results of the appraisal affect the income of township doctors." When conducting the assessment, the Health Management Department also give full consideration to the residents' opinions, so as to understand their true feelings about the services. In this way, the department can give feedback to the health management team and make timely adjustments and optimization according to the problems found, realizing interaction between service providers and recipients.

In addition, the consortium established a performance-based pay system. According to an employee of Caiqiao Health Center, "After the construction of the medical consortium, although the workload has increased, my salary and subsidies also rose, so I feel more motivated." The leverage of medical insurance funds has also been given full play, and the surplus of medical insurance has been allocated following the principle of "3:2:2:3" (30% to village medical staff, 20% to township medical staff, 20% to county hospitals, and 30 % to town medical institutions), so as to encourage the medical staff to prioritize the health of residents and place equal emphasis on treatment and prevention, and promote the good use of medical insurance funds in the medical consortium.

5.2 Empirical study and evaluation indicators of the integrated health management in close-knit medical consortium from the perspective of Service Chain Theory

5.2.1 Evaluation indicators of the integrated health management in close-knit medical consortium

Based on the theoretical framework mentioned in Chapter 3, we developed a comprehensive evaluation indicator system. After reviewing related studies and analyzing the interviews, we designed an indicator system that is systematic, relevant, scientific and representative. The system consists of four dimensions (service guarantee, service guidance, service supply, and service evaluation), 11 secondary indicators, and 58 tertiary indicators in Annex F: Table F.4.

5.2.1.1 Service Guarantee

Service guarantee is a prerequisite for carrying out integrated health management. The government stipulated supportive policies, offered guidance and management supervision, and carried out the top-level design to provide a sound external environment for integrating health

management in the consortium with close ties. After reviewing previous studies and analyzing the situation, we identified four secondary indicators (shared vision, supportive policies, payment guarantee and information-sharing system) and 19 tertiary indicators.

(1) Shared vision

A shared vision enables members of the medical consortium to work toward a goal, and serves as an important motivator. This part examines whether the close-knit medical consortium has a consistent medium- and long-term development goal, and the sense of belonging and identification of its members.

(2) Supportive policies

The policy is a key element in promoting integrated health management. On the one hand, government coordination is needed both horizontally and vertically in solving the problems of poor communication and unclear responsibilities of all parties. On the other hand, the government offers guidance for the consortium with policies. Therefore, the evaluation indicators of the supportive policies should include: (1) policies concerning the construction of the close-knit medical consortium, (2) policies about differentiated medical insurance reimbursement in the medical consortium, (3) policies regarding advance payment and surplus retention of medical insurance funds, (4) systems for managing the quality of medical services, (5) flexible patient transfer standards and procedures, (6) policies allowing physicians to work in any member of the medical consortium, (7) measures for providing patients with a continuum of services, including prevention, treatment, rehabilitation, and healthcare services, (8) policies to better serve the residents, such as health education, long-term prescriptions and extended prescriptions for patients with chronic diseases, and (9) preferential medical insurance policies for patients transferred within the medical consortium.

(3) Payment guarantee

In order to guide the development of the medical consortium, official agencies should increase their investment in public health and promote healthcare and disease prevention. Meanwhile, appropriate financial subsidies should be provided at the early stage of construction to reduce the loss brought by the reform to members of the medical consortium. Therefore, the evaluation indicators in the payment guarantee should include: (1) the average proportion of health service investment in the overall government expenditure in the past three years, (2) the average proportion of government investment in the total income of the health community in the past three years, (3) the per capita cost of health services, and (4) the per capita subsidizes for basic public health.

(4) Information-sharing system

The construction of a regional information-sharing platform within a county medical consortium is a fundamental project to realize integrated health management, which can effectively improve the efficiency of health resource allocation and health resource utilization in the medical consortium and provide information guarantee for integrated health management. Therefore, the evaluation indicators of the information-sharing system should include: (1) mutual recognition of examination and test results offered by medical institutions at county and rural levels within a close-knit medical consortium, (2) completion and effective operation of the telemedicine system connecting the leading hospital and township health centers in the close-knit medical consortium, (3) monthly remote consultations in the consortium, (4) continuous electronic health records and electronic medical records in the consortium, and (5) the sharing of residents' health information in the consortium.

5.2.1.2 Service guidance

Service guidance is the basis for integrated health management, and the service quality of primary medical institutions will affect the provision of integrated health management services. The county hospital is responsible for directing the health management services of township health centers and village clinics. It works with primary healthcare institutions to deliver "primary healthcare" and "flexible inter-hospital patient transfer", so as to promote the tiered diagnosis and treatment system. After the literature review and research analysis, we identified two secondary indicators (technical guidance and training exchange) and 11 tertiary indicators.

(1) Technical guidance

Technical guidance refers to professionals from the leading hospital visiting medical institutions at the grassroots level to offer guidance, such as clinical teaching, teaching on a ward round, and technical guidance on health education. They also participate in offering primary medical services, outpatient services, consultations, and ward rounds. The evaluation indicators of technical guidance include: (1) the number of township health centers supported by the leading hospital, (2) the number of village clinics supported by the leading hospital, (3) the situation of clinical teaching, teaching on a ward round, and technical guidance on health education, department construction, new technology, and new projects of medical staff from the leading hospital per year, (4) the number of professionals dispatched by the leading hospital to work in primary medical institutions per year, and (5) the service delivery number of senior experts from the leading hospital in terms of outpatient services, ward rounds, and consultations (including remote consultations) per year.

(2) Training programs and exchanges

As for the indicator of training programs and exchanges, it assesses the training programs offered by the county hospital to the medical personnel at primary medical institutions and the exchanges between medical staff from institutions at various levels. The evaluation indicators include: (1) the number of free training programs offered by the leading hospital for primary medical institutions per year, (2) the number of people selected by primary medical institutions to study at the leading hospital per year, (3) the number of people from primary medical institutions to study at the leading hospital for more than three months per year, (4) the establishment of the weekly meeting system of in the consortium, (5) the number of "teacher-apprentice" pairs—mentoring relationship between physicians of the leading hospital and physicians of primary healthcare institutions, and (6) the establishment of timely communication mechanism between county-level experts and primary healthcare physicians and general practitioners.

5.2.1.3 Service delivery

Service delivery is the main part of the integrated health management model. It is provided to county residents by member institutions of the close-knit medical consortium. After literature review and research analysis, we put forward three secondary indicators (integration of healthcare and disease prevention, service models, and service motivators) and 19 tertiary indicators.

(1) Integration of healthcare and disease prevention

The integration of healthcare and disease prevention examines whether the family doctor team has considered disease prevention when providing medical services. The evaluation indicators of this dimension include: (1) the percentage of key populations registered with family doctors in the medical consortium, (2) the percent of the region's residents having health records, (3) the number of general practitioners per 10,000 people, and (4) the number of public health doctors per 10,000 people.

(2) Service model

The service model examines the integrated services of "prevention – treatment – healthcare – rehabilitation – health education" delivered by family doctors. Its focus is to assess (1) the integration between the medical staff from medical institutions at the county, rural, and village levels, and (2) the cooperation of medical personnel of different specialties in providing health management services. The evaluation indicators include: (1) the provision of county-wide medical checkup services, (2) disease screening for high-risk groups, (3) leading hospital experts managing the family doctor team, (4) "mobile pharmacies" for people with common

diseases and chronic diseases in the close-knit medical consortium, (5) the provision of continuous services involving "prevention, diagnosis and treatment, rehabilitation, and healthcare" by family doctors according to the health status of the contracted population, (6) personalized service plans designed by family doctors for the elderly, children, pregnant women, and people with disabilities, (7) home visits to key groups by the leaders of family doctors per month, (8) the health-monitoring services and medication suggestions offered by family doctors to the population with chronic disease per month, (9) the number of health education and policy promotion activities organized by family doctors to the contracted population per month, and (10) "one-to-one" medical services delivered by specialists from the leading hospital to patients with chronic diseases, in rehabilitation, or with other special conditions.

(3) Service motivators

The service motivator is an important tool to encourage medical personnel in the medical consortium to collaborate in providing services, and to propel the leading hospital to dispatch their specialists and primary medical personnel to stay at the grassroots level to improve the medical services of primary medical institutions. The evaluation indicators of the service motivator include: (1) a fair and reasonable system for distributing medical insurance funds surplus, (2) the ratio between the average income of medical staff with intermediate titles in the leading hospital and the average income of those in primary medical institutions, (3) average daily subsidies for specialists dispatched by the leading hospital, (4) subsidies for personnel visiting higher-level medical institutions in the medical consortium for training programs, and (5) subsidies for household follow-up visits by family doctors based on the number of visits.

5.2.1.4 Service evaluation

Service evaluation is an important guarantee for the sustainable development of integrated health management in medical consortium. With timely assessment, we can understand the current situation of the integrated health management in the close-knit medical consortium, so as to identify problems and settle them in time, and continuously optimize the service delivery network. After reviewing previous studies and conducting research analysis, we identified two secondary indicators (assessment and supervision, and feedback mechanism) as well as nine tertiary indicators.

(1) Assessment and supervision

The assessment and supervision examine whether government departments outside the medical consortium and the leading hospital of the medical consortium conduct a top-down assessment of the integrated health management services delivered by the close-knit medical

consortium, so as to understand the effect of integrated health management, and to reward and punish staff according to the appraisal results. The evaluation indicators include: (1) a special management department in charge of regular assessment of the medical services offered by primary healthcare institutions, (2) regular assessment of the family doctor teams, (3) regular assessment of the primary treatment rate and patient transfer rate of primary healthcare institutions, (4) regular assessment of the service volume of family doctor teams, (5) regular assessment of the health knowledge awareness rate of the population registered with family doctors, and (6) regular assessment of the improvement of the health status of the population registered with family doctors.

(2) Feedback mechanism

The feedback mechanism is designed to solicit opinions of service providers and service recipients, so that problems can be identified in time. The evaluation indicators include: (1) the effectiveness of feedback channels in the close-knit medical consortium, (2) the experiences of outpatient patients with regards to the coordination and collaboration among the healthcare providers within the consortium, and (3) the experiences of inpatient patients with regards to the coordination and collaboration among the healthcare providers in the consortium.

5.2.2 Preliminary screening of the evaluation index system for integrated health management in close-knit medical consortium

5.2.2.1 First round of expert consultation

(1) Basic information of the experts

In this study, we consulted experts working in the fields of hospital management, healthcare management, and public health. A total of 15 experts from 10 universities in provinces such as Jiangsu, Zhejiang, Anhui, Sichuan, Guangdong, Shandong, and Henan were selected. Most of the experts have doctoral degrees and have worked in relevant fields for over 10 years. Over 90% of them have the titles of associate professor or above. The details are shown in Table 5.1.

Table 5.1 Basic information of the experts

Basic information		Population	Proportion (%)
Gender	Male	8	53.3
	Female	7	46.7
Age	30-39	5	33.3
	40-49	9	60
	50-59	1	6.7
Field	Public health	3	20
	Healthcare management	10	66.7
	Hospital management	2	13.3

Basic information		Population	Proportion (%)
Academic qualification	Master	1	6.7
	Doctoral level or above	14	93.3
Technical title	Professor	8	53.3
	Associate professor	6	40
	Intermediate	1	6.7
Work experience	1-9	1	6.7
	10-14	6	40
	15-19	5	33.3
	≥20	3	20

(2) Analysis of the positivity coefficient

Expert positivity, which indicates the degree of attention and participation of the experts involved in the consultation, is reflected in positivity coefficients. The positive coefficient is the percentage of experts involved in the consultation with all experts. Studies have shown that the positivity coefficient should not be lower than 0.50, and an ideal positivity coefficient should be higher than 0.70. A number higher than 0.80 indicates a high level of positivity. In the first round of expert consultation, 15 questionnaires were distributed and all of them were returned, with a 100% return rate, indicating a positivity coefficient of 1, which shows a high level of attention and participation of experts.

(3) Analysis of the authoritative coefficient

Relevant studies show that when the authoritative coefficient (Cr) is greater than 0.7, it indicates that the reliability of the round of expert consultation is high. Through the first round of expert consultation, it could be calculated that the experts' judgment basis of the indicators (Ca) was 0.80, the expert's familiarity with the indicators (Cs) was 0.88, and the experts' authoritative coefficient (Cr) was 0.84, indicating that the results of expert consultation were more reliable. The specific data are shown in Table 5.2.

Table 5.2 Expert authority

	Judgment basis	Familiarity	Authority
Service guarantee	0.76	0.83	0.80
Service guidance	0.77	0.92	0.85
Service delivery	0.84	0.92	0.88
Service evaluation	0.80	0.85	0.83

(4) Analysis of the concordance coefficient

The experts' opinion concordance coefficient, also known as Kendall's coefficient of concordance, is generally expressed as W. The coefficient ranges from 0 to 1, and the closer this coefficient is to 1, the higher the opinion concordance among experts. As can be seen from Table 5.3, the chi-square tests for the w values in terms of the importance, operability, and validity of expert consultation in the first round of expert consultation were statistically significant ($P < 0.05$), and the w values of importance and operability were higher than 0.3,

indicating that the concordance of expert consultation in this round was better.

Table 5.3 Kendall's coefficient of concordance (first round)

	W	χ^2	p
Importance	0.477	514.692	0.000
Operability	0.277	299.189	0.000
Validity	0.341	368.130	0.000

5.2.2.2 Analysis results of the first round of expert consultation

In the first round of expert consultation, each expert was required to rate the indicators in terms of their importance, operability and validity. The score ranged from 1 to 10, with 1 indicating the lowest score and 10 indicating the highest score. Based on the results of the experts' scores, we calculated the mean, standard deviation and coefficient of variation of each index. The larger the mean score, the higher the importance, operability and feasibility of the index; the smaller the standard deviation, the higher the concordance of experts' opinions; the smaller the coefficient of variation, the higher the concordance among experts.

(1) The scores of the primary indicators in the first round of expert consultation

In the primary indicators, all indicators were assigned importance scores greater than 8, including 8.33 for service assurance, 9.53 for service guidance, 9.73 for service delivery and 8.67 for service assessment. The operability was assigned an importance score greater than 8, including 8.13 for service assurance, 9.27 for service guidance, 9.40 for service delivery, and 8.8 for service assessment. The validity was assigned a score greater than 8, including 8.4 for service assurance, 9.6 for service guidance, 10 for service delivery, and 8.73 for service assessment. The coefficient of variation was less than 15%, indicating that the expert concordance was high, and the results of expert consultation were good. The specific data are shown in Table 5.4.

Table 5.4 Results of the expert consultation on primary indicators (first round)

Primary indicators	Importance		Operability		Validity	
	$\overline{X}\pm S$	CV (%)	$\overline{X}\pm S$	CV (%)	$\overline{X}\pm S$	CV (%)
Service guarantee	8.33±0.90	10.80	8.13±0.92	11.25	8.40±0.83	9.86
Service guidance	9.53±0.64	6.72	9.27±0.59	6.41	9.60±0.51	5.28
Service delivery	9.73±0.46	4.71	9.40±0.63	6.72	10.00±0.00	0.00
Service evaluation	8.67±0.72	8.35	8.80±0.56	6.38	8.73±0.70	8.06

(2) The scores of the secondary indicators in the first round of expert consultation

In terms of the importance score, that of the shared vision was 7.53, lower than 8; and those of the other indicators were no less than 8, including 4 indicators with scores greater than 9. The technical guidance received the highest importance score of 9.87.

As for the operability scores, the shared vision and feedback mechanism got 7.13 and 7.93, respectively, lower than 8. The rest of the indicators were rated higher than 8, with 5 of the

scores higher than 9. Technical guidance and service model got the highest score of 9.6.

With regards to the validity scores, except for the shared vision (7.67), the rest of the indicators were rated greater than 8, including 3 greater than 9. The service model received the highest score of 9.67.

All coefficients of variation were less than 20%. However, the coefficient of variation of importance, coefficient of variation of operability and coefficient of variation of validity of the shared vision were greater than 15%. Thus, the expert consultation of this indicator reflected a poor result. The specific data are shown in Annex F: Table F.5.

(3) The scores of the tertiary indicators in the first round of expert consultation

Six indicators were assigned importance ratings between 7 and 8, and the rest were greater than 8. The minimum value was 7.4 (establishment of a weekly meeting system) and the maximum value was 9.6 (completion and effective operation of the telemedicine system between the leading hospital and the township health centers). Twelve indicators were assigned scores between 7 and 8, and the remaining indicators were all greater than 8, with the minimum value of 7.6 (the percent of the region's residents having health records, preferential medical insurance system for patients transferred within the medical consortium). The maximum value was 9.6 (the provision of continuous services involving "diagnosis and treatment, rehabilitation, and long-term healthcare"). The specific data are shown in Annex F: Table F.6.

5.2.2.3 Analysis of expert consultation results

The first round of expert consultation included 4 primary indicators, 11 secondary indicators, and 58 tertiary indicators. We deleted the evaluation indicators with importance scores lower than 8, coefficients of standard deviation greater than 1, and coefficients of variation greater than 15% (Wang, 2011). According to the importance scores and experts suggestions, We edited out one secondary indicator (shared vision), and six tertiary indicators, including per capita cost of healthcare services, per capita subsidy of basic public health, the number of township health centers supported in the close-knit medical consortium, the number of village clinics supported in the close-knit medical consortium, the construction of weekly meeting system, and regular evaluation of the health knowledge awareness rate of the group registered with family doctors. The final decision was made to delete six tertiary indicators, including per capita cost of healthcare services, per capita subsidy of basic public health, the number of township health centers supported in the close-knit medical consortium, the number of village clinics supported in the close-knit medical consortium, the construction of weekly meeting system, and regular evaluation of the health knowledge awareness rate of the group registered with family doctors,

and modify the two secondary indicators payment guarantee and service power.

According to the scoring by experts and their suggestions on adjustments, we had a penal discussion and identified indicators of the second round of expert consultation.

Adjustments in the indicators are as follows:

Primary indicators: Because the scores of three primary indicators (importance, operability, and validity) were greater than 8 and the coefficient of variation was less than 15%, no adjustment was made to the primary indicators.

Secondary indicators: We changed "payment guarantee" to "financial guarantee", and turned "service motivator" to "service encouragements". Although "shared vision" received low scores and high coefficients of deviation, after discussion, we decided to keep the indicator. The decision lies in that the shared vision represents that all members of the consortium have the same goal and are willing to achieve it together, demonstrating a prerequisite and subjective motivation for a true "close-knit" medical consortium.

Tertiary indicators: We moderated the following indicators: (1) "regular assessment of the primary treatment rate and patient transfer rate of primary healthcare institutions"—"annual assessment of the primary treatment rate and patient transfer rate of primary healthcare institutions", (2) "regular assessment of the service volume of family doctor teams" to "annual assessment of the service volume of family doctor teams", (3) "regular assessment of the health knowledge awareness rate of the population registered with family doctors"—"annual assessment of the health knowledge awareness rate of the population registered with family doctors", (4) "regular assessment of the improvement of the health status of the population registered with family doctors"—"annual assessment of the improvement of the health status of the population registered with family doctors". The following indicators were deleted because they got low scores in terms of importance and operability: (1) "per capita cost of health services", (2) "the number of village clinics supported in a close-knit medical consortium", and (3) "a weekly meeting system in the close-knit medical consortium". The following indicators were retained and the reasons for doing so were stated in brackets: (1) "per capita subsidies for basic public health services" (it is mentioned in the national basic public health program and the cost can reflect the importance of prevention in the medical consortium to a certain extent), (2) "the number of township health centers supported in the close-knit medical consortium" (the number of village clinics supported in the medical consortium has been deleted, and keeping this indicator can help understand the leading hospital' technical guidance to primary healthcare institutions).

5.2.3 Second round of expert consultation

5.2.3.1 Analysis of expert consultation

(1) Positivity coefficients of experts

In this study, 15 experts who participated in the first round of consultation engaged in the second round of consultation. We distributed 15 questionnaires, and 15 valid consultation forms were returned, demonstrating a return rate of 100% and a positivity coefficient of 1.

(2) Concordance coefficient of experts

As can be seen from Table 5.5, the chi-square tests for the w values of importance, operability, and validity of expert consultation in the second round are statistically significant ($P < 0.05$), indicating better concordance of the second round of expert consultation.

Table 5.5 Concordance coefficients of experts' opinions (second round)

	W	χ^2	p
Importance	0.575	586.302	0.000
Operability	0.475	484.222	0.000
Validity	0.521	531.210	0.000

5.2.3.2 Analysis results of the second round of expert consultation

(1) The scores of the primary indicators in the second round of expert consultation

In the primary indicators, the importance scores of indicators were assigned greater than 8, including 8.07 for service guarantee, 9.47 for service guidance, 9.67 for service delivery, and 8.07 for service evaluation.

As for operability scores, service guarantee and service evaluation were assigned lower than 8, with 7.93 for service guarantee and 7.8 for service evaluation. Service guidance and service delivery received scores higher than 9, with 9.47 for service guidance and 9.67 for service delivery.

In terms of validity scores, all primary indicators were rated higher than 8, including 8.13 for service guarantee, 8.93 for service guidance, 9.73 for service delivery, and 8.2 for service evaluation.

All coefficients of variation were less than 15%, indicating a high degree of expert concordance and good results from expert consultation.

The specific data are shown in Table 5.6.

Table 5.6 The scores of the primary indicators (second round)

Primary indicators	Importance		Operability		Validity	
	$\overline{X}\pm S$	CV (%)	$\overline{X}\pm S$	CV (%)	$\overline{X}\pm S$	CV (%)
Service guarantee	8.07±0.80	9.90	7.93±0.88	11.15	8.13±0.74	9.17
Service guidance	9.47±0.52	5.45	9.33±0.49	5.23	8.93±1.10	12.32
Service delivery	9.67±0.62	6.38	9.00±0.38	4.20	9.73±0.59	6.10
Service evaluation	8.07±0.80	9.90	7.80±1.08	13.87	8.20±0.68	8.24

(2) The scores of the secondary indicators in the second round of expert consultation

As for importance scores, indicators with scores lower than 8 are as follows: the shared vision, information-sharing system, training programs and exchanges, and assessment and supervision. The rest of the secondary indicators were rated higher than 8, including 9.53 for financial guarantee (the highest score).

In terms of operability scores, except for the shared vision scored lower than 7, the rest of the indicator scores were greater than 7, including four indicators receiving scores not less than 9. Technical guidance was assigned with the highest score of 9.33.

With respect to validity scores, shared vision was the only indicator rated lower than 7. The rest of the indicators were assigned scores higher than 7, and technical guidance received the highest score of 9.53.

The coefficient of variation of each indicator was less than 20%. Shared vision and feedback mechanism had the coefficients of variation greater than 15%, which needed further discussion. For more details, see Annex F: Tables F.7.

(3) The scores of the tertiary indicators in the second round of expert consultation

The minimum importance score was 7 (the number of township health centers supported in the close-knit medical consortium), the minimum operability score was 6.2 (the sense of belonging and identification of member institutions of the close-knit medical consortium), and the minimum validity score was 6.73 (the sense of belonging and identification of member institutions of the close-knit medical consortium, The number of health education and policy promotion activities organized by family doctors to the contracted population per month).

The indicators with coefficients of variation greater than 20% include (1) the sense of belonging and identification of member institutions in the close-knit medical consortium and (2) the number of township health centers supported in the close-knit medical consortium. Both of them had poor expert consultation results. For details, see Annex F: Table F.8.

5.2.3.3 Second round of expert results analysis

The second round of expert consultation involved four primary indicators, 11 secondary indicators, and 54 tertiary indicators. We decided to delete indicators with an importance score

lower than 8, standard deviation greater than 1, and coefficient of variation greater than 15%. Based on the criteria, we edited out one secondary indicator (shared vision), and six tertiary indicators, including: the sense of belonging and identification of member institutions in the close-knit medical consortium, policies about differentiated medical insurance reimbursement, the number of township health centers supported in the close-knit medical consortium, the timely communication mechanism connecting county specialists and primary healthcare physicians and general practitioners, the percentage of key populations registered with family doctors in the medical consortium, and the number of health education and policy promotion activities organized by family doctors to the contracted population per month.

According to the scores rated by experts and their suggestions for adjustments, we had a penal discussion and made the following changes:

(1) Primary indicators: All primary indicators scored high, and the experts' opinions on the indicators showed high unity. Thus, all primary indicators remained the same.

(2) Secondary indicators: "Shared vision" received low scores with respect to importance, operability, and validity, and was assigned with a high coefficient of variation, which was not much different from the results of the first round of expert consultation. After a penal discussion, the indicator was retained. Because experts expressed similar opinions on the rest of the indicators, we made no adjustments to them.

(3) Tertiary indicators: We adapted "the provision of continuous services involving diagnosis and treatment, rehabilitation, and healthcare" to "the provision of continuous services involving disease prevention, diagnosis and treatment, rehabilitation, and healthcare". The following items were deleted because of their low scores with regard to importance, operability, validity, and a high coefficient of variation 1) "policies about differentiated medical insurance reimbursement", 2) "the number of township health centers supported in the close-knit medical consortium", and 3) "a timely communication mechanism connecting county specialists and primary healthcare physicians and general practitioners". We edited out "county-wide medical examination services" because of its poor specificity, and maintained "disease screening for high-risk groups", which was more specific and could better reflect the characteristics of the service model. We kept "the percentage of key populations registered with family doctors" and "the number of health education and policy promotion activities organized by family doctors to the contracted population per month", because we believed that the two indicators could reflect the degree of emphasis on the integration of treatment and prevention in the integrated health management of the close-knit medical consortium, especially whether prevention is the main focus in the practice.

(4) Determination of index system: Through two rounds of expert consultation, experts' opinions converged and agreed with 4 primary indicators, 11 secondary indicators, and 50 tertiary indicators. The results are shown in see Annex F: Table F.9.

5.2.4 Weights of the evaluation indicators

The importance of each indicator at the same level is often reflected by weights. The weight is an important part of the evaluation indicator system, and its reliability and correctness will directly affect the construction of the indicator system and the final evaluation.

5.2.4.1 Analytic hierarchy process

The Analytic Hierarchy Process (AHP) is a general theory of measurement. It is used to derive ratio scales from both discrete and continuous pared comparisons. These comparisons may be taken from actual measurements or from a fundamental scale which reflects the relative strength of preferences and feelings. The AHP has a special concern with departure from consistency, its measurement and on dependence within and between the groups of elements of its structure. It has found its widest applications in multi-criteria decision-making, planning and resource allocation and in conflict resolution. In its general form, the AHP is a nonlinear framework for carrying out both deductive and inductive thinking without use of the syllogism by taking several factors into consideration simultaneously allowing for dependence and for feedback and making numerical tradeoffs to arrive at a synthesis or conclusion.

5.2.4.2 Calculating the weight of an indicator

Through the AHP, the importance of indicators was first compared in pairs with the 1-9 scale method, and the corresponding judgment matrix was constructed according to the comparison results, as follows.

(1) Constructing a multi-level analysis structure. As the evaluation target, the integrated health management of a close-knit medical consortium was located at the highest level. The second-highest level showed the secondary indicators of service guarantee, service guidance, service delivery, and service evaluation. Under this level, more specific indicators were added to construct the multi-level analysis structure, as shown in Figure 5.4.
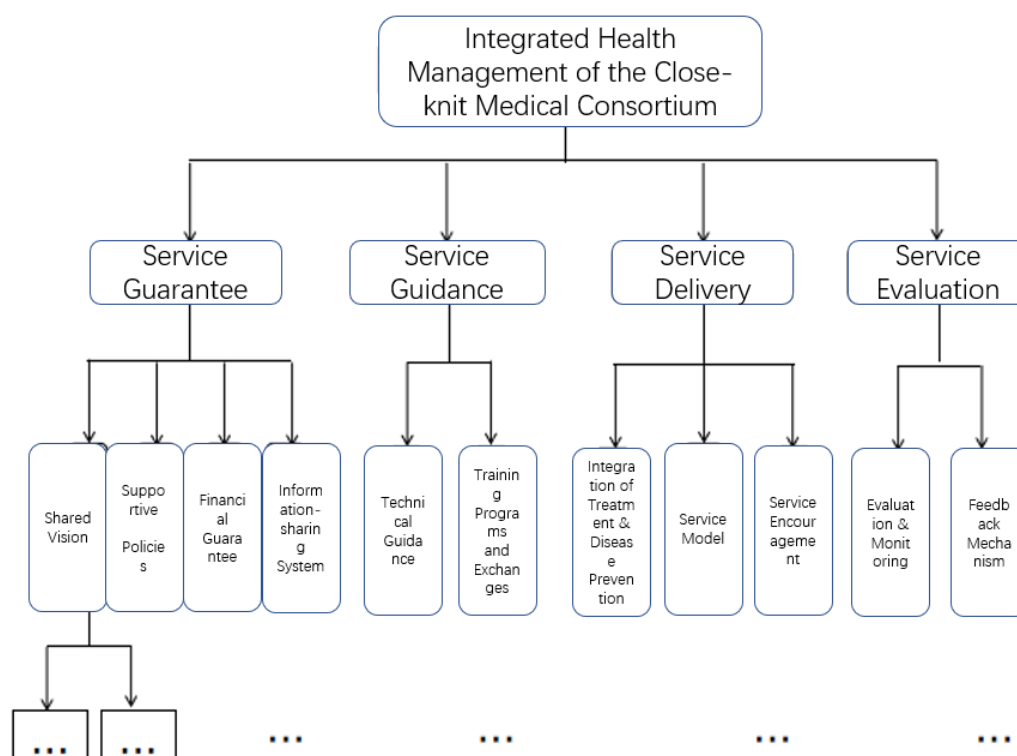
Figure 5.4 Hierarchical model of the integrated health management evaluation in close-knit medical consortium

(2) Construction of judgment matrix. Using the numbers 1 to 9 and their reciprocals to rate the importance of each indicator and collect the corresponding weight scoring table. The specific meaning of the numbers is shown in Table 5.7 in the evaluation system composed of multiple indicators, the importance of indicator i and indicator j is compared relative to the previous dimension, and the judgment matrix is constructed according to the comparison results, i.e., A = (aij) n + n. There are a total of 16 judgment matrices in this study.

Table 5.7 Significance scale meaning table

Scaling	Meaning
1	Equally important
3	The left indicator is slightly more important than the top indicator
5	The left indicator is significantly more important than the top indicator
7	The left indicator is more strongly important than the top indicator
9	The left indicator is extremely more important than the top indicator
2,4,6,8	The median of the above two adjacent judgments
Reciprocal	i is compared to j in the scale is Aij, then j is 1/Aij compared to i

(3) Calculation results. After expert consultation, the importance of indicators was first compared in pairs by using the 1-9 scale method, and the corresponding judgment matrix was constructed according to the comparison results. Then, we adopted the software yaahp13.0 to organize the judgment matrix and calculate the indicator weights to derive the weight of each indicator. The Composite Index (CI) value of each indicator should be less than 0.10, and the

indicators that are beyond the range need to be corrected, so as to ensure that there is no logical omission in the priority order of the indicators, and the weights obtained from the calculation are acceptable. The results are shown in see Annex F: Table F.10.

5.2.5 Comprehensive evaluation of the integrated health management capacity of close-knit medical consortium in pilot areas in Jiangsu Province

5.2.5.1 Sample institution selection and data collection

Among the twenty-four pilot counties (cities and districts) in Jiangsu Province listed in the *List of Pilot Provinces and Pilot Counties for the Construction of Close-knit Medical Consortiums* issued by the National Healthcare Commission in 2019, eight close-knit medical consortiums were selected as research samples according to geographic location, economic development level, and research needs. Three of them are in southern Jiangsu Province, two in central Jiangsu Province, and three in northern Jiangsu Province. They were numbered H1, H2, H3, H4, H5, H6, H7, and H8, respectively. According to the established evaluation indicator system, we designed an institutional questionnaire to conduct on-site surveys in terms of service guarantee, service guidance, service delivery, and service evaluation. In November 2022, we consulted the people in charge of health management in the closely-knit medical consortium.

5.2.5.2 Evaluation of the overall capacity of the integrated health management in close-knit medical consortium

(1) Weighted rank-sum ratio (WRSR)

Rank-sum Ratio (RSR) is a statistical analysis method proposed by Professor Tian Fengdiao in 1988 (Tian, 2002), which combines the advantages of classical parametric statistics and modern nonparametric statistics. The basic idea of RSR is to obtain dimensionless statistic RSR in a matrix of n rows (n evaluation objects) and m columns (m evaluation indexes or grades) through rank transformation and sort the merits and defects of evaluation objects by RSR value. Then, according to the number of comparison groups, the classification process (a large number of comparison groups) or the RSR square root arcsine transform value confidence interval processing a small number of comparison groups) is carried out. The RSR method performs an overall ranking based on the dimensionless statistics of 0-1 obtained from the average value of the rank sum of the corresponding comparison sequence under each index.

The weighted rank sum ratio (WRSR) differs from RSR in that it focuses on the weight of each indicator, i.e., importance. Thus, the results of the assessment are more objective and

accurate. The WRSR method has no specific requirements for the data analyzed and is widely used. It combines classical parameter estimation with recent nonparametric statistics and produces more accurate and reliable analysis results. WRSR takes the rank score as the calculation unit, excluding the interference caused by the outliers of indicators in the evaluation.

(2) Value and ranking of evaluation indicators

The values of each indicator of each research object are ranked according to the requirements of the WRSR method. The indicators are classified into three types: high superiority, medium superiority, and low superiority, and different ranking methods are used for different types of indicators. The high superiority index was assigned the minimum value of 1 in the range of 1-n, and the low superiority index was assigned the maximum value of 1. All the indicators in this study are high indicators except for the ratio between the average income of medical staff with intermediate titles in the leading hospital and the average income of those in primary medical institutions. The evaluation indicator values and the ranking of the indicators of each close-knit medical consortium are shown in Annex F: Table F.11.

(3) WRSR frequency distribution and regression equation

The WRSR value of each close-knit medical consortium was calculated based on the ranking of each indicator of the medical consortium with the following formula.

$$WRSR_i = \frac{1}{n}\sum_{j=1}^{m}W_jR_{ij} \qquad\qquad \dots\dots\dots\dots\dots\dots\dots(5.1)$$

$i \in \{1, 2, ..., n\}; j = \in \{1, 2, ..., m\}$; R_{ij} - the ranking of the jth indicator of the i-th close-knit medical consortium; W_j - the weight of the jth indicator, $\sum_{j=1}^{m}W_j = 1$.

The WRSR values in this study represent the capacity and level of integrated health management of the study subjects, as detailed in Annex F: Table F.12.

Annex F: Table F.13 shows the distribution frequency of WRSR values, and we calculated the frequency (f), cumulative frequency (Σf), ranking (r), mean ranking (R) and downward cumulative frequency (P = `R / n) of WRSR values in each group. P was transformed into the corresponding standard normal deviation (u + 5) – the Probit value, as detailed in Annex F: Table F.13.

On SPSS 25.0 software, linear regression analysis was performed with Probit as the independent variable and WRSR as the dependent variable. The results showed that there was a linear correlation between WRSR and Probit, r= 0.988. The fitted regression equation was $\widehat{WRSR}$ = -0.171+ 0.14, Probit (F= 250.723, p= 0.000< 0.05), indicating that the equation is

statistically significant. The WRSR values for each of the close-knit medical consortium was brought into the regression equation to obtain their respective corresponding WRSR estimates, as detailed in Annex F: Table F.14.

(4) Capability grading of the integrated health management in close-knit medical consortium

According to the principle of optimal grading, the eight medical consortiums were divided into three grades: high, medium, and low. The grades were tiered by referring to the Probit value of the critical value of the percentile PX under the commonly used criteria. The Probit value was brought into the regression equation to obtain the estimated value of WRSR, which was used as the grading boundary. The final grading results showed that H3 and H7 have high capacity for integrated health management in close-knit medical consortium, H1, H2, H4, H5, and H6 have medium capacity, and H8 has low capacity. The results are shown in Table 5.8. The chi-square test of the grading results shows that $P= 0.855> 0.05$. The ANOVA results showed that $F= 9.931$, $P= 0.018< 0.05$, indicating that the differences between the three grades were statistically significant.

Table 5.8 Grading of overall capabilities for integrated health management in the close-knit medical consortium

Grade	PX	Probit	WRSR estimates	Grading results
Low	<P15.866	<4	<0.389	H8
Medium	P15.866~	4~	0.389~	H1, H2, H4, H5, H6
High	P84.134~	6	0.669~	H3, H7

5.2.5.3 Analysis of comprehensive evaluation results of integrated health management in the close-knit medical consortium

Using the indicator system constructed in this study, we collected the relevant indicator data of the eight close-knit medical consortiums, and the WRSR method was used for comprehensive evaluation. According to the management capability, eight close-knit medical consortiums were ranked in pecking order as H7, H3, H2, H1, H4, H6, H5, and H8. H7 and H3 had a high capability of integrated health management, H2, H4, H6, H5 had a medium capability of integrated health management, and H8 had a low capability of integrated health management. After ranking the eight close-knit medical consortiums pluralin Jiangsu Province in terms of integrated health management, we found that the three medical consortiums in the economically developed region, southern Jiangsu, all ranked in the top four, while those in central Jiangsu and northern Jiangsu ranked in the bottom, with one in northern Jiangsu having the lowest score. The result demonstrates that the capability of integrated health management in the close-knit

medical consortium is correlated with economic development and geographical location. Nevertheless, this is not always the case. H7, although located in northern Jiangsu, ranked first. This may be related to the attention of government departments and the degree of joint efforts of medical institutions in the medical consortium.

(1) Evaluation of service guarantee

With regard to service guarantee, a sound top-level design by relevant government departments is the prerequisite for the close-knit medical consortium to carry out integrated health management. On the whole, the three regions showed similar capabilities in terms of shared vision and supportive policies. As for financial guarantee, the high proportion of government financial investment in northern Jiangsu may be due to the backward economic development in this region, which requires greater government investment to bridge the operational gap with other regions' medical consortiums. With reference to information-sharing system, all three close-knit medical consortiums in southern Jiangsu have built telemedicine systems and are operating effectively, and the information-sharing system is significantly better than that in central and northern Jiangsu. The number of teleconsultations in northern Jiangsu is smaller and the utilization of information technology is not ideal. With regard to specific study subjects, H7 in northern Jiangsu and H3 in southern Jiangsu have the best information-sharing system, and the highest level of information-sharing, which reaches level 5. Building a big data platform for information-sharing can reduce information gaps, improve service quality, speed up service delivery, and avoid unreasonable expenditures and waste of resources, thus improving the efficiency of patient transfer in the medical consortium. We can find that H8, located in northern Jiangsu, has not built a remote communication system so far, and cannot carry out remote consultation, and the degree of sharing of residents' health information is low. The lack of an information platform for guiding health management makes it difficult to bring the value of health big data into play and hinders the provision of integrated health management services.

(2) Evaluation of service guidance

Service guidance is the basis for channeling high-quality medical resources, and it has a high weight of 0.3014 in the evaluation indicator system of integrated health management in the close-knit medical consortium. In general, southern Jiangsu performed better than central Jiangsu and northern Jiangsu in terms of technical guidance. However, when it comes to training programs and exchanges, southern and northern Jiangsu had similar performance, while the performance in central Jiangsu was poor, and only a few medical staff from the lower-level institutions had studied at the leading hospital. With regard to specific study subjects, H7

in northern Jiangsu and H3 in southern Jiangsu had done better in dispatching professionals to lower-level institutions, effectively improving the level of primary medical services. H7 and H3 had offered over 1000 times of technical guidance by professionals from the leading hospitals to other member institutions, and they provided over 300 times of outpatient services, ward rounds, and consultations at the primary hospitals, far exceeding the other six medical consortiums. Meanwhile, H7 and H3 also actively train grassroots health personnel, with more than 10 trips by them to the leading hospital for training for more than 3 months each year, and they have the largest number of "teacher-apprentice" pairs. H8 in northern Jiangsu Province has done poorly in sharing human resources in the medical consortiums. Only a few professionals from the leading hospitals offered services such as outpatient services, ward rounds, and consultations at primary healthcare institutions. The number of "teacher-apprentices" is zero, which is not conducive to improving the service of primary healthcare institutions and will affect the integrated health management services provided by the medical consortiums.

(3) Evaluation of service delivery

Service delivery is the core of integrated health management. It is mainly provided by medical personnel from county and rural medical institutions and has the highest weight of 0.4006 in the evaluation indicator system. On the whole, the integration of healthcare and disease prevention in southern Jiangsu is significantly better than that in central and northern Jiangsu. The service delivery in central Jiangsu is poorer than that in southern and northern Jiangsu. The region has poor performance with respect to (1) the proportion of specialists from the leading hospital in leaders of family doctor teams, (2) the number of home visits to key groups by leaders of family doctor teams per month, (3) health-monitoring services and medication suggestions offered by family doctors to the population with chronic diseases per month, (4) the number of health education and policy promotion activities organized by family doctors to the contracted population per month. It can be seen that the integration of disease prevention-diagnosis and treatment-rehabilitation-healthcare has not yet been realized in central Jiangsu. The region has not yet completed its tasks in terms of improving the health awareness of residents, resulting in an immature integrated health management service model and a low service delivery capacity. Central Jiangsu performs better in terms of service encouragement, as evidenced by (1) the smallest ratio between the average income of medical staff with intermediate titles in the leading hospital and the average income of those in primary medical institutions, and (2) the highest daily subsidies for specialists dispatched by the leading hospital. In terms of specific study subjects, H7 in northern Jiangsu and H3 in southern Jiangsu have the best performance with regard to the service model. For example, the percentage of leading

hospital specialists administering family doctors is more than 20%, and the monthly number of leading hospital specialists providing "one-to-one" consultation services to patients with special conditions is more than 200. This fully reflects the region's achievements in channeling advantageous medical resources and the integration of medical services at the county and rural levels.

H8 at northern Jiangsu is not doing good in terms of service model. As shown in Annex F: Table F.14, (1) experts from the leading hospital are not yet the main person in charge of family doctor teams, and (2) the number of times that experts from the leading hospital visit key management groups is only 0.5 times per month, and (3) the number of times that experts from the leading hospital provide "one-to-one" medical services to patients with special conditions is only 60 per month, which is much lower than that of other consortiums, and (4) the leading hospital in H8 is less involved in the services of primary medical institutions, and (5) the consortium has not yet achieved the integration of personnel from the county and rural medical institutions.

Motivated by a reasonable distribution of medical insurance surplus funds, medical staff from H7 and H3 have a strong incentive to provide services. H8 has not yet distributed the surplus of medical insurance funds among the three levels of medical institutions, and the daily subsidy for dispatched specialists is the least, at 160 RMB. Therefore, it should improve the encouragement mechanism and implement a feasible mechanism for distributing medical insurance funds surplus, guide the channeling of high-quality specialist resources and increase the motivation of medical personnel in the three levels of medical institutions to provide better services.

(4) Evaluation of service evaluation

Service evaluation is a guarantee for the sustainable development of integrated health management in the close-knit medical consortium. In general, except for the frequency of regular annual assessments of family doctor teams and the effectiveness of feedback channels (the northern region has done slightly better than the other two), the overall difference between the performance of the three is not significant.

In terms of specific study subjects, H7 and H3 achieved regular monthly assessments of family doctor teams, which to a certain extent ensured the quality-of-service delivery. In contrast, H8 only appraises family doctors six times a year, which is less frequent.

In addition, H7 is the only medical consortium that will examine the improvement of the health of the people registered with family doctors, which can provide a better understanding of the effect of family doctors in providing integrated health management services and provide

a better incentive for the family doctor teams.

5.3 Factors affecting the health of patients with chronic diseases

5.3.1 Sample characteristics of the chronically ill population

5.3.1.1 Characteristics of respondents with diabetes mellitus

Overall, (1) 66.44% of the surveyed diabetic patients were over 65 years old; (2) more women (63.37%) than men; (3) 74.69% had elementary school education or under; (4) their annual personal income was mainly between 1000-2000 (42.36%); (5) most patients (65.15%) suffered from chronic diseases other than diabetes; (6) a very small proportion of patients had diagnosed emotional disorders such as anxiety or depression (2.52%), with varying degrees of disabling conditions (8.21%); (7) the mean self-assessment score of patients in both groups was 72.94 (± a standard deviation of 11.55); (8) the correct rate of patients' diabetes knowledge answers was 52.20 (±16.38); (9) the mean diabetes-related emotional state score was 11.82 (±7.55), (10) the mean self-efficacy score was 6.36 (±1.28); (11) the support scores of social resource utilization were 4.23 (±0.55) for the healthcare worker dimension, 3.76(±0.65) for the family and friends dimension, and the neighborhood and community support dimension was 2.92 (±0.92).

As for the features of the control group, (1) there were fewer men (37.55%) than women; (2) 68.16% were 65 years and older; (3) only 8.23% of patients have degrees of high school or higher education; (4) annual personal income was mainly between 1000-2000 (46.91%); (5) more than half of the patients had chronic diseases other than diabetes (63.11%); (6) very few patients had emotional disorders (2.15%); (7) the majority of patients were able to take care of themselves independently (91.29%); (8) the mean self-health assessment score was 72.54 (±10.98); (9) the correct rate of patients' diabetes knowledge answers was 53.54 (±16.23); (10) the diabetes-related emotional state score was 12.91 (±6.58); (11) the self-efficacy score was 6.09 (±1.14); (12) the support scores of social resource utilization were 4.23 (±0.59) for healthcare professionals, 3.79 (±0.59) for family and friends, and 2.78 (±0.88) for the neighborhood and community support.

In the experimental group, (1) 64.50% of the diabetic patients were 65 years old or above; (2) most of the patients were female (64.40%); (3) the patients had a low level of education, with 82.46% having a junior high school education or under; (4) most patients had an annual personal income between 1000-2000 (37.28%); (5) most of the patients had chronic diseases other than diabetes (67.43%); (6) the majority of patients were able to take care of themselves

independently (92.36%); (7) the self-assessment score was 73.39 (±12.14); (8) the correct rate of patients' knowledge answers about diabetes was 50.70 (±16.44); (9) the score of diabetes-related emotional state was 10.60 (±8.34); (10) the score of self-efficacy was 6.67 (±1.35); (11) the score of social resource utilization was 4.23 (±0.50) for medical and nursing staff support, and 3.73 (±0.71) for family and friends support, and 3.09 (±0.94) for neighborhood and community support. For more details, see Annex F: Table F.15.

5.3.1.2 Characteristics of survey respondents with hypertension

(1) A high percentage of the surveyed hypertensive patients were over 65 years old (73.98%); (2) the proportion of men and women was 42.19% and 57.81%, respectively; (3) the vast majority of patients had received elementary school education or below (74.29%); (4) patients' annual personal income was mainly between 1000-2000 (45.56%); (5) more than half of the patient suffered from chronic diseases other than hypertension (55.28%); (6) very few patients had diagnosed emotional disorders such as anxiety or depression (2.49%); (7) Few patients had varying degrees of disabling conditions (7.64%); (8) the score of self-health assessment in both groups was 73.31 (±11.99); (9) the self-efficacy score was6.53 (±1.28); (10) the support scores were 4.23 (±0.53) for the healthcare providers, 3.76 (±0.67) for the family and friends, and 2.98 (±0.91) for the neighborhood and community.

In the control group, (1) 75.02% of the hypertensive patients were 65 years old or older; (2) fewer men than women (60.45%); (3) the patients received a low level of education, with only 6.61% having a high school education or higher; (4) most of the patients had an annual personal income between 1000-2000 (51.22%); (5) more than half of the patients had co-morbidities of chronic diseases other than hypertension (61.72%); (6) the majority of the patients were able to take care of themselves independently (90.04%); (7) very few patients had emotional disorders (2.26%); (8) the majority of patients were able to take care of themselves independently (90.04%); (9) the self-health assessment score was 71.83 (±11.36); (10) the self-efficacy score was 6.16 (±1.12); (11) in the use of social resources for treating chronic diseases, the support score was 4.23 (±0.58) for healthcare professionals, 3.77 (±0.60) for family and friends, and 2.85 (±0.87) for neighborhood and community.

In the experimental group, (1) 72.97% of patients were 65 years old or older; (2) more than half of the patients were female (55.27%); (3) patients had a low level of education, with 91.02% having a junior high school education or under; (4) most patients had an annual personal income mainly between 1000-2000 (40.11%); (5) nearly half of the patients had chronic diseases other than hypertension (49.08%); (6) the majority of patients were able to take care of themselves

independently (94.59%); (7) the self-assessment score was 74.74 (±12.39); (8) the self-efficacy score was 6.89 (±1.32); (9) in the use of social resources for chronic diseases, the score was 4.23 (±0.48) for medical and nursing staff support, 3.74 (±0.73) for family and friend support, and 3.11 (±0.94) for neighborhood and community support. For more details, see Annex F: Table F.16.

5.3.2 Self-management behaviors and life quality of people with chronic diseases

5.3.2.1 Self-management behaviors and life quality of people with diabetes

The overall score of self-management behaviors of patients in both groups was 37.86 (±7.84), the overall score of patients in the experimental group was 40.22 (±8.52), and the overall score of patients in the control group was 35.76 (±6.49).

The overall self-management level of patients in the experimental group was better; the analysis of the scores of specific items of self-management behaviors showed that the best thing that patients in both groups did was follow medical advice 5.94 (±2.21), and the worst was to monitor their blood sugar level 1.23 (±1.05). The scores of the rest are as follows: the scores of diabetic diets 5.42 (±1.43), healthy diet 5.15 (±1.11), exercise management 2.65 (±2.07), and footcare 1.54 (±2.19).

The experimental group scored significantly higher in the items of healthy diet 5.28 (±1.24), exercise 2.84 (±2.05), blood sugar monitoring 1.60 (±1.12), and footcare 2.02 (±2.45) than the control group, which presents the scores in the items of healthy diet 5.05 (±0.98), exercise 2.49 (±2.08), and blood sugar monitoring 0.90 (±0.87), and footcare (1.11±1.82).

There were no significant differences between the two groups of diabetic patients in terms of diabetic diet and medication adherence.

The total score of life quality in both groups was 48.28 (±8.23). The score of diabetic patients in the experimental group 46.81 (±8.69) was significantly lower than that of those in the control group 49.60 (±7.57), indicating that people of experimental group have better quality of life.

Among the various items of life quality, patients had the highest score in physical function 2.00 (±0.46) and the lowest score in social relations 1.34 (±0.28). The experimental group of diabetic patients had significantly lower scores in physical functioning 1.93 (±0.47), mental state 1.70 (±0.38), social relations 1.31 (±0.27), and treatment feelings 1.58 (±0.43) than the control group, which presents the scores in physical functioning 2.06 (±0.44), mental state 1.82 (±0.31), social relations 1.36 (± 0.28), and treatment feelings 1.63 (±0.36) scores. The details

are shown in Annex F: Table F.17.

5.3.2.2 Self-management behaviors and life quality of people with hypertension

The overall score of self-management behavior of hypertensive patients in both groups was 122.98 (±13.23), the mean score of patients in the experimental group was 123.71 (±15.27), and that of patients in the control group was 122.22 (±10.67), indicating a better self-management level of the experimental group.

According to the analysis of each specific item score, both groups did the best in taking medication as prescribed by the doctor, with a score of 4.82 (±0.52), and the worst in monitoring disease, with a score of 2.40 (±0.58).

The experimental group had significantly lower scores with regard to diet management 3.66 (±0.61), emotional management 3.57 (±0.85), and work and rest balance 4.13 (±0.64) than those of the control group, which got higher scores of diet management 3.78 (±0.40), emotional management (3.61±0.74), and work and rest balance 4.17 (±0.61).

The scores of the experimental group in the items of medication management 4.77 (±0.57), condition monitoring 2.66 (±0.64), and exercise management 3.05 (±1.16) were significantly higher than those of the control patients, which presents the scores in the items of medication management 4.77 (±0.57), condition monitoring 2.13 (±0.34), and exercise management 2.83 (±1.10).

The total score of life quality in both groups was 194.35 (±12.43). Patients in the experimental group got significantly higher scores 196.51 (±12.30) than in patients in the control group 192.10 (±12.17). Among the individual items, the lowest life quality score was for physical function 61.80 (±14.90), and the highest score was for mental function 93.61 (±6.96). There was no significant difference in the scores of the two groups in psychological functioning. The patients in the experimental group had a higher life quality score in three items of somatic function 64.97 (±14.68), social function 58.50 (±14.41) and hypertension-specific module 82.90 (±11.90) than the control group, which presents the scores in somatic function 81.17 (±11.14), social function 74.98 (±9.32) and hypertension-specific module 72.86 (±9.38) scores. The details are shown in Annex F: Table F.18.

5.3.3 Follow-up services for patients with chronic diseases in integrated health management

Binhai County Hospital and Caiqiao Township Health Center (experimental group) have performed an integrated health management model in the close-knit medical consortium, i.e.,

through the combination of doctors, nurses and public health personnel of different departments, and through the association of doctors at the "county-township-village" level, the medical consortium established a health management team to service patients with chronic disease. Through home visits, phone calls, and outpatient follow-up visits, the health management team provides follow-up services for patients with chronic diseases such as diabetes and hypertension, and provides patients with services such as measuring blood sugar/blood pressure, asking about symptoms related to diabetes/hypertension, asking about other diseases, asking about medication, asking about medical consultations, advising to quit smoking, advising to quit drinking, advising to exercise moderately, advising to eat a low-fat diet, and advising to eat a low-salt diet.

5.3.3.1 Follow-up service for patients with diabetes

In this study, we collected data about follow-up services to diabetic patients in Caiqiao town (experimental group) in the past 3 months (Annex F: Table F.19). Pie charts of the frequency of follow-up visits were drawn (Annex G: Figure G.1), and bar charts were made to show the items and models of the follow-up visits (Annex G: Figure G.2 and Annex G: Figure G.3). According to the graphs, all of the patients in the experimental group had received follow-up services in the last 3 months, and more than 80% of the patients had received at least 3 times of follow-up services in the last 3 months. Among a wide range of service items, the most common one is blood sugar measurement, with more than 99% of the patients in the sample receiving it. Nevertheless, the health management team rarely provided health behavior guidance to patients with regard to dissuading them from smoking and drinking alcohol, with a service coverage rate below 15%. More than 99% of diabetic patients received home follow-up services, and telephone follow-up services were less frequently adopted (36.23%).

5.3.3.2 Follow-up services for patients with hypertension

The statistics of follow-up visits to the experimental group in the past 3 months are shown in Annex F: Table F.20. Annex G: Figure G.4 shows the pie chart of the frequency of follow-up visits received by the patients, and Annex G: Figure G.5 and Annex G: Figure G.6 show the bar charts of the service items, and the models of follow-up visits. According to the graphs, two of the hypertensive patients in the sample group did not receive follow-up services in the last three months, and more than 75% of the patients received at least three follow-up services. The most widely used follow-up item was blood pressure measurement, with a coverage rate of more than 99%, while the coverage rate of health behavior guidance such as persuasion to quit smoking

and persuasion to quit drinking was lower than 50%; more than 99% of the patients received home visits, and the telephone follow-up service was less frequently taken (38.74%).

5.3.4 Effect of integrated health management services on self-management behaviors and life quality of people with chronic diseases

5.3.4.1 Effect of integrated health management on self-management behavior and life quality in people with diabetes

Two multiple linear regression models were estimated, one for each dependent variable (self-management behaviors and life quality). Annex F: Table F.21 shows the effect of integrated health management on self-management behaviors and life quality of people with diabetes. The results show that compared with diabetic patients who did not receive integrated health management, diabetic patients who received integrated health management had significantly higher scores on self-management behavior. Based on the regression model, we concluded that under controlled conditions, the self-management behavior scores of the sample group who received the service would be on average 4.557 points higher than the scores of the sample patients who did not receive the service.

The self-management behaviors of diabetic patients were also significantly influenced by factors such as diabetes-related health knowledge, diabetes-related emotional state, self-efficacy, social support, gender, annual income, mental diseases, and self-rated health state. Having adequate knowledge of diabetes helped patients to make better decisions. For every 1% increase on average in patients' correct answers to the diabetes knowledge questionnaire, their scores on self-management behavior increased by 0.06 points on average. In addition, the diabetes-related emotional state was positively associated with self-management behavior, and when diabetes caused more psychological stress to patients, they will pay more attention to controlling their behaviors (Coef. = 0.097).

Self-efficacy and healthcare providers' support were negatively associated with self-management behavior (Coef. =-0.438, -4.102); support from family and friends (Coef. =1.910) and neighborhood community (Coef. =2.440) were positively associated with it. Female patients had weaker self-management than male patients. Patients with income of 1000-2000 (Coef. =1.057) and income of 5000 or more (Coef. =2.039) did better in self-management than patients with income below 1000 per year. Diabetic patients with anxiety and depression did better in this regard (Coef. =2.248), while those with high self-rated health had poorer performance (Coef. =-0.040).

The regression results for life quality showed that compared with those who did not receive the service, patients who received integrated health management had significantly lower scores on the DQOL scale, and that the mean score on the DQOL scale for patients with diabetes who had taken the service was 0.516 points lower on average than that for patients who did not receive it. Higher scores in this scale means poorer quality of life, therefore patients who received the service have better quality of life.

The results showed that receiving integrated healthcare management can improve the life quality of patients, which is also affected by factors such as diabetes-related emotional state, self-efficacy, social support, age, gender, annual income, and self-care ability. (1) Diabetes-related emotional state was positively correlated with life quality score (Coef. =0.391), and the more stressful and emotionally burdensome diabetes caused to patients, the poorer the life quality of patients would be. (2) Self-efficacy (Coef. =-1.351) and neighborhood support (Coef. =-1.064) were negatively related to life quality scores. Patients with high self-efficacy and more neighborhood support had better life quality. (3) Support from family and friends was positively correlated with life quality scores (Coef. =2.959), and patients with more adequate support had lower life quality. (4) Older diabetic patients (65 years and above) had a lower life quality compared to those under 65-year-old (Coef. =1.073). (5) Female patients had a lower life quality compared to male patients (Coef. =0.975). (6) Patients with an annual income below \$1000 had a lower life quality compared to patients with an income above \$1000 (Coef. =-0.040). (7) Diabetic patients with disabling conditions had a lower life quality than patients who were able to take care of themselves (Coef. =-0.040).

5.3.4.2 Effect of integrated health management on self-management behavior and life quality in people with hypertension

Annex F: Table F.22 shows the effect of integrated health management on self-management behaviors and life quality of people with hypertension. The results show that hypertensive patients who received the service had significantly higher scores on the self-management behavior scale compared with those who did not receive it, and the mean score of self-management behavior of hypertensive patients in the sample who received it would increase by 1.458 points on average compared with those who did not take it.

Regarding other factors, self-management behaviors of the patients were significantly influenced by self-efficacy, social support, age, gender, annual income, emotional illness, physical functioning, and self-rated health status. (1) Patients with high levels of self-efficacy had lower scores of self-management behaviors, with an average decrease of 0.393 points in

self-management behavior scores for every 1-point increase in self-efficacy. (2) Patients' self-management behaviors were positively associated with social support from healthcare providers (Coef. =7.360), family and friends (Coef. =6.371), and neighborhood community (Coef. =2.020). (3) Similar to the results of the diabetes analysis, older patients (65 years old and above) had worse self-management behaviors compared to those under 65 years old (Coef. =-1.602). (4) Female patients did significantly better than male patients (Coef. =1.121). (5) Patients with income above ¥1000 had better self-management compared to those with annual income below ¥1000 (Coef. =2.524, 4.931, 3.741). (6) Patients with anxiety and depression had lower levels of self-management than patients without mood disorders (Coef. =-3.580). (7) Hypertensive patients who were able to live independently had better self-management behaviors than those who were dysfunctional (Coef. =3.655). (8) Self-management behavior was better in hypertensive patients with high self-rated health (Coef. =0.071).

The comparison results showed that hypertensive patients who received integrated health management had significantly higher scores on the life quality scale relative to hypertensive patients who did not receive it. When other factors remained unchanged, the mean score of life quality in hypertensive patients who received it would be 0.880 points higher than the mean score of patients who did not receive the service. As the QLICD-HY is a positive scale, hypertensive patients who received the service had better life quality than those who did not do so. Regarding other factors, life quality of hypertensive patients was significantly associated with self-efficacy, social support, age, gender, education level, annual income, co-morbidity with other chronic diseases, self-care ability and patient's self-rated health score. Self-efficacy (Coef. =2.374), support from family and friends (Coef. =1.906), and support from neighborhood community (Coef. =1.812) were positively associated with patients' life quality. Support and assistance from healthcare providers showed a significant negative association with patient's life quality (Coef. =-4.732). Among patients, older hypertensive patients (65 years old and above) had lower life quality (Coef. =-2.087). Females had lower life quality than males (Coef. =-1.657). Patients with an annual income of less than ¥1000 had a lower life quality score compared to those with an income of 2000 or above (Coef. =0.071). Self-rated health status and life quality were positively correlated (Coef. =0.256).

5.3.5 Effect of integrating health management follow-up services on self-management behaviors and life quality of people with chronic diseases

In this part of the regression analysis, we categorized the 10 follow-up items provided to patients with diabetes and hypertension in Table 4.2 and Table 4.3 into three major categories:

chronic disease diagnosis and treatment services, disease management guidance, and health behavior guidance. The services of measuring blood sugar/blood pressure and asking about diabetes/hypertension symptoms, which were directly provided by the follow-up visitors, were classified as chronic disease diagnosis and treatment services. Asking about other diseases, medication and medical consultation (treatment) was used by the health management institutions to understand the current management and severity of diabetes and hypertension of patients, so that the patients could receive personalized guidance. The five persuasion services of quitting smoking, quitting drinking, exercising moderately, eating a low-fat diet, and eating a low-salt diet were the guidance of health behavior and lifestyle habits, and are classified as health behavior guidance services.

5.3.5.1 Effect of follow-up services on self-management behavior and life quality of people with diabetes

Annex F: Table F.23 shows the effect of follow-up services on self-management behaviors and life quality of the experimental group. The regression results for self-management behaviors showed that the frequency of follow-up services, items of follow-up services, and models of follow-up services were significantly associated with patients' self-management behaviors. When other factors were under control, the self-management behavior scores of patients who had more than two follow-up visits in the last three months were on average 2.361 points higher than those who had less than two visits. Consultation services (Coef. =-1.537) and disease management programs (Coef. =-3.100) in follow-up visits were negatively associated with patients' self-management behavior, and every increase in health behavior instruction items increased patients' self-management behavior scores by an average of 0.93. Patients who received home follow-up services (Coef. =-5.702) and telephone follow-up services (Coef. =-5.057) had relatively lower levels of self-management. Patients with sound knowledge of diabetes (Coef. =0.044) and high emotional burden caused by diabetes (Coef. =0.069) had better self-management behavior. Support from healthcare professionals was negatively associated with patients' self-management behavior (Coef. =-3.513) and support from the neighborhood community was positively associated with self-management behavior (Coef. =2.621). Patients with an annual income of ￥5000 or more did better in self-management behaviors than patients with income below ￥1000 (Coef. =3.477). Subjective health scores were negatively associated with patients' self-management (Coef. =-0.156).

Regression results showed that, when other factors remained the same, compared with people that received less than or equal to 2 follow-up visits in the last 3 months, the patients

who received the services at least once a month had 1.76 points lower scores of qualities of life on average, had better quality of life on average. For each additional item of disease treatment services, the score of life quality decreased on average by 1.909 points. The life quality of patients who got telephone calls was relatively less adversely affected by diabetes (Coef. =-1.058). The life quality of patients who received outpatient follow-up services was relatively more adversely affected by diabetes (Coef. =1.857). Correct knowledge of diabetes (Coef. =0.066) and diabetes-related emotional state (Coef. =0.516) were positively associated with patients' life quality scores, and patients with better knowledge of diabetes and those who were more emotionally burdened by diabetes had poorer life quality. Self-efficacy was positively related to patients' quality of life (Coef. =-0.445). Patients with more support from health care providers (Coef. =1.537) and family and friends (Coef. =1.741) had poorer life quality. Older patients (over 65 years old) had a higher life quality affected by diabetes (Coef. =1.304). Women with diabetes had poorer life quality than men (Coef. =1.165). Quality of life was more affected by diabetes in patients with incomes between ¥ 2000-5000 (Coef. =3.550) and those with incomes above ¥ 5000 (Coef. =1.901) compared to those with annual incomes below ¥ 1000 (Coef. =1.741). The quality of life of patients suffering from anxiety and depression was relatively less affected by diabetes (Coef. =-2.503). Patients with higher subjective health scores had better life quality (Coef. =-0.112).

5.3.5.2 Effect of follow-up services on self-management behavior and life quality of people with hypertension

Annex F: Table F.24 shows the effect of follow-up services on self-management and life quality of the experimental group. The regression results of self-management behavior showed that the frequency, items, and models of follow-up visits had a significant effect on patients' self-management behavior. Patients with hypertension who received follow-up services over twice in the last 3 months had relatively higher self-management behavior scores, 2.256 points higher than those who did not get services at this frequency on average. The chronic disease diagnosis and treatment services were negatively associated with patients' self-management behaviors, and health behavior guidance was positively associated with self-management behaviors. When other factors were under control, patients' self-management scores decreased by 3.632 on average for each additional hypertension diagnosis and treatment service, and it increased by an average of 0.944 for each additional health behavior guidance item. Patients who received follow-up telephone services (Coef. =-3.787) and follow-up outpatient services (Coef. =-2.582) had lower self-management scores. Regarding other factors, self-management behavior of

hypertensive patients was significantly influenced by self-efficacy, social support, gender, annual income, mental diseases, physical functioning, and self-rated health status.

Patients with higher self-efficacy (Coef. =0.730) and more adequate support from healthcare providers (Coef. =10.924), family and friends (Coef. =4.874), and neighborhood community (Coef. =3.089) had better self-management behaviors. Women had significantly better self-management (Coef. =2.134). Income was associated with self-management (Coef. =3.349, 5.674, 5.452). Diagnosed anxiety and depression (Coef. =-6.754), and disability (Coef. =-6.639) would affect the actions of patients. Self-management behaviors were negatively associated with self-rated health status (Coef. =-0.110).

Regression results for life quality also showed that frequency, items, and models of follow-up services had a significant effect on the life quality of patients with hypertension. When other factors remained unchanged, hypertensive patients who received more than 2 health follow-up visits in the past 3 months had a life quality score 2.332 points lower than those who received services 2 times at most. Among the items of follow-up visits, disease treatment instructions were negatively associated with patients' life quality, with each additional item of treatment instructions received by patients decreasing their life quality score by 4.351 points on average. Follow-up telephone calls (Coef. =3.257) and follow-up outpatient services (Coef. =3.022) both significantly improved patients' life quality. Regarding other factors, self-efficacy, social support, age, gender, education level, annual income, self-care ability and self-health score all had a significant impact on the life quality of patients with diabetes - self-efficacy (Coef. =1.973), support and help from family and friends (Coef. =1.410), and neighborhood community (Coef. =1.890) were positively associated with the life quality of patients with hypertension. Support provided by healthcare professionals was negatively associated with patients' life quality (Coef. =-3.895). The life quality of senior patients (65 years and above) was significantly low (Coef. =-2.539), and male patients had significantly better life quality (Coef. =-1.902). Patients having received junior and senior high school (Coef. =2.758, 3.873) education had significantly higher life quality (Coef. =3.022) compared to patients with elementary school and lower education levels. Patients with an annual income of less than ¥1000 had significantly poorer life quality compared to those with an income of ¥ 2000-5000 (Coef. =-3.292). The life quality of patients with disabling hypertension was significantly low (Coef. =-4.568). Life quality was positively correlated with self-rated health status (Coef. =0.087).

5.3.6 Self-management behaviors and factors influencing life quality in the control group with chronic diseases

5.3.6.1 Factors influencing self-management behavior and life quality of a control group with diabetes mellitus

Annex F: Tables F.25 demonstrated the analysis of factors influencing self-management behaviors and life quality of the control group. Self-management behaviors of people with diabetes were significantly associated with diabetes-related knowledge, diabetes-related emotional state, self-efficacy, social support, education, and income. Diabetes-related knowledge and diabetes-related emotional burden on patients were positively associated with patients' self-management behaviors. For every 1% increase in the correct rate of answers about diabetes-related knowledge on average, patients' self-management scores were 0.053 higher on average. As for the diabetes-related questionnaire, when other factors were under control, for every 1-point increase, self-management scores increased by 0.068 points. Social support provided by health care professionals (Coef. =-4.276) was negatively associated with self-management behavior, and support and assistance provided by family and friends (Coef. =1.913) and neighborhood community (Coef. =3.061) was positively associated with it. Patients who had received secondary or high school education would have significantly better self-management levels compared to those who only received elementary education or under (Coef. =1.205). Patients with an annual income of ¥ 2000-5000 had significantly lower levels of self-management behaviors than patients with an annual income of less than ¥ 1000 (Coef. =-2.443).

The regression results of the factors influencing life quality showed that diabetes-related knowledge, diabetes-related emotional state, self-efficacy, social support, age, gender, income, self-care ability, and subjective health scores were significantly associated with the life quality of patients with diabetes. Diabetes-related knowledge was negatively associated with patients' life quality scale scores (Coef. =-0.046), and diabetes-related emotional state was positively associated with patients' life quality scores (Coef. =0.176). The negative impact of diabetes on patients' life quality decreased with increased diabetes knowledge, and the emotional burden and psychological stress caused by diabetes were negatively associated with patients' life quality. The average increase in self-efficacy score was 2.796 for every 1-point increase in other factors, and the average decrease in life quality score was 2.796. Support from healthcare providers did not have a significant effect on improving life quality, and support from family and friends was positively associated with patients' life quality score (Coef. =2.198). Patients who received more help from family and friends had poorer life quality, and support and help

from the neighborhood community were significantly negatively associated with patients' life quality scores (Coef. =-0.926). Patients with an annual income of ¥2000-5000 had significantly higher life quality scores compared to those with an annual income of less than ¥1000 (Coef. =5.194). In addition, the negative impact of diabetes on life quality was significantly greater for those over 65 years old than for younger adults (Coef. =1.069). The life quality of those with physical disabilities was more adversely affected by diabetes than those with full self-care capacity (Coef. =2.335). Self-directed health scores were positively correlated with life quality scores (Coef. =0.038).

5.3.6.2 Analysis of factors influencing self-management behavior and life quality of people with hypertension in control group

Annex F: Table F.26 shows the effects of self-management behaviors and life quality of the control group. The regression results showed that self-management of hypertensive patients was significantly associated with self-efficacy, social support, gender, education level, income, self-care ability, and subjective health score. Hypertensive patients with high self-efficacy scores had lower scores on self-management behaviors (Coef. =-2.670). Patients with more adequate resources on the dimensions of healthcare provider (Coef. =5.575), family and friends (Coef. =5.268) and neighborhood community (Coef. =1.450) had better self-management behaviors. Older patients (over 65 years old) had poorer self-management (Coef. =-2.297). Patients with a bachelor's degree or higher degrees had better scores on the self-management scale (Coef. =20.32) than patients who only attended elementary school. Patients with an annual income of ¥2000-5000 had better self-management behavior compared to patients whose income was less than ¥1000 (Coef. =3.918). Patients with disabling conditions had higher self-management behavior scores (Coef. =6.851), and subjective health scores were positively correlated with self-management behavior scores (Coef. =0.215).

The results of the analysis of factors influencing life quality showed that the life quality of patients with hypertension was positively correlated with their self-efficacy scores, and for each 1-point increase in their self-efficacy, patients' life quality scores increased by an average of 2.994. Patients who received more support from healthcare providers had lower life quality (Coef. =-4.168), while those who were helped by family and friends (Coef. =1.582), and neighborhood community (Coef. =2.589) had higher life quality. Female patients had poorer life quality (Coef. =-1.390). Senior patients had poorer life quality (Coef. =-1.330). Compared with patients whose annual income was less than ¥1000, those having an annual income of over ¥2000 had better life quality (Coef. =-4.400, -3.468). Disabled patients (Coef. =-8.092)

and hypertensive patients with co-morbidities (Coef. =-2.424) had poorer life quality, while those suffering from mood disorders such as anxiety and depression (Coef. =3.143) had better life quality. Subjective health scores were positively associated with the life quality of hypertensive patients (Coef. =0.335).

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Chapter 6: Discussion

6.1 The Case Study on Health Management Services of Bin Hai County Medical Community

This study constructs a model of integrated health management of a close-knit medical consortium based on the service chain theory and analyzes the constructing process of this model using the Binhai close-knit medical consortium in Jiangsu Province as an example. Based on the service chain theory, this model is divided into four levels: service guarantee, service guidance, service provision, and service evaluation. Effective service guarantee relies on the government's leadership in designing top-level systems, including policy support, payment guarantee, information infrastructure, and shared vision. It is a critical prerequisite for achieving integrated health management. Service guidance is fundamental to the integration of health management and is primarily provided by leading hospitals to offer technical support, training, and communication to primary healthcare institutions. Service provided by a medical community involves a collaborative effort among various medical institutions to deliver integrated, comprehensive, and full-cycle health services. These services include prevention, diagnosis and treatment, nursing care, rehabilitation, and health promotion, and are designed to support the holistic management of health. This approach to healthcare delivery represents the cornerstone of integrated health management. Service motivation and service evaluation are the driving forces that promote continuous improvement and development of integrated health management.

The analysis of the typical case of the "Binhai Model" offered valuable insights for developing an integrated health management model for medical communities in China. Firstly, integrated health management services depend on the government's support services, including the development of relevant policies, the determination of medical insurance payment plans, and the establishment of information platforms. Such efforts lay a solid foundation for the development of medical communities, ensuring the unity and cooperation of the alliance. Secondly, improving the service capabilities of primary medical institutions is an essential precondition for providing effective integrated health management services. Through targeted assistance, medical staff at different levels can work closely together to improve the service

quality at the grassroots level, ultimately providing homogeneous high-quality medical services within a medical community. Thirdly, integrated health management services require the participation of medical institutions at various levels in the county. The health management team must integrate the expertise of county-level specialist doctors, township-level general practitioners, family doctors, and public health doctors to ensure targeted and professional services. Moreover, the integrated health management model should be oriented towards the health of residents rather than diseases, offering integrated health services to meet the diverse health needs of residents. Finally, a scientifically rigorous supervision, assessment, and feedback mechanism is critical to sustaining the development of integrated health management. Such mechanisms enable the optimization of service quality, while also motivating and inspiring medical staff to be more committed to their work. These four aspects are interlinked, forming a tightly knit service network that influences and supervises each other, promoting the construction and development of a close-knit medical consortium.

After conducting field research and investigation, it has become apparent that the closely-knit medical community's integrated health management model in Binhai County needs continuous optimization and improvement. Several issues require attention. Firstly, the fragmentation of public policies is hindering the deep integration of a medical community. Secondly, there is a shortage of professional talent, and the quality of primary medical institutions needs to be improved. Thirdly, the incentive role of medical insurance needs to be fully played. Fourthly, the support role of information technology needs to be strengthened. Lastly, the compliance of villagers is poor, and their health literacy needs to be improved.

6.2 Discussion on the comprehensive evaluation of integrated health management capacity of close-knit medical consortiums pilot areas in Jiangsu Province

6.2.1 The gap in health management services among close medical communities in various regions of Jiangsu Province

After conducting a comprehensive evaluation, it can be found that the close-knit medical consortium in the southern region of Jiangsu province ranked higher in the overall ability of integrated health management than the central and northern regions, which is correlated with the level of economic development. Firstly, the economic development level in the southern region of Jiangsu province is relatively higher, and the close-knit medical consortium in this

region has undergone a longer period of exploration, resulting in a more mature and developed system. After carefully studying and understanding the relevant health policy documents issued by national and higher-level governments, the government departments in the southern region have formulated beneficial policies that are tailored to local conditions, which has effectively facilitated the establishment and development of integrated health management services based on local conditions, timing, and individual needs. Additionally, in the southern region, more emphasis is placed on information construction, resulting in a well-functioning system that facilitates the timely acquisition and sharing of residents' health information, accelerating the pace of integrating health management services. Secondly, the managers within the close-knit medical consortium in the southern region have successfully popularized the service concept and behavioral values centered on residents' health. Medical staff at all levels of medical institutions have a high level of recognition and understanding of integrated health management. In comparison to regions with lower levels of economic development, regions with higher levels of economic development have a more complete medical staff salary system, higher medical standards, better promotion platforms, and medical and health resources. As a result, competent medical talents are concentrated in leading hospitals of regions with higher economic development levels. Moreover, there is close cooperation and communication between the leading hospitals and primary medical institutions in the southern region of Jiangsu province. Leading hospitals have rich high-quality human resources to support primary medical institutions, and the incentive mechanism is relatively mature and complete.

6.2.2 Need to strengthen information construction in the central and northern regions of Jiangsu Province

It can be seen that government departments have laid a solid foundation for the integrated health management development of close-knit medical consortiums since the southern, northern, and central regions have relatively balanced capabilities in terms of common vision, policy support, and financial security. However, the information construction and utilization in the central and northern regions lag behind that of the southern region. To establish a truly integrated system of health management within the framework of medical communities, it is crucial to strengthen information construction and fully leverage the value and convenience of information platforms. Information construction is a fundamental project that underpins the construction of close-knit medical consortiums for health management integration. It facilitates the timely collection of residents' health information, synchronizes information updates, and provides the basis for continuous services to residents. Furthermore, sharing necessary information is a means of

reducing costs and improving service efficiency for both parties. Without the interoperability and sharing of health information, it is impossible to establish effective linkage for integrated health management under the medical community framework. To achieve these goals, substantial investments of manpower, material resources, and financial resources are required, and the government must provide support and guidance to accelerate the pace of information construction in the central and northern regions of Jiangsu Province.

6.2.3 Need to improve the service capacity of primary medical institutions in the central and northern regions of Jiangsu

The key to building a close-knit medical consortium for integrated health management is to have high-quality medical resources flow from higher-level institutions to primary medical institutions to improve their infrastructure and service provision capabilities. Therefore, it is crucial for a close-knit medical consortium to establish a smooth communication channel between higher-level institutions and primary medical institutions, enabling high-quality human resources to move up and down. According to our analysis, central and northern regions of Jiangsu (except for H7) tend to focus on only one aspect of technical guidance or training exchange, without fully realizing the mutual exchange between experts from leading hospitals and primary medical staff. This issue may be influenced by the economic development status of a region. In less economically developed regions, there may be a scarcity of high-quality human resources available, including medical staff. Additionally, medical staff may be less willing to stay at the grassroots level due to factors such as heavier workloads and a lack of time and energy to participate in training. Therefore, government departments should pay attention to assigning experts from leading hospitals to provide consultations, training, guidance, and cooperative management, according to relevant policies. To improve the service capacity of primary medical institutions, medical staff need to be selected regularly to study and learn at higher-level institutions, constantly improving their professional and technical capabilities, and bringing back the knowledge and skills to primary medical institutions, enhancing their overall development capabilities. Ultimately, this can relieve the tension among primary medical staff from the root and achieve a collaborative relationship among medical institutions at all levels, with the sharing of high-quality resources.

6.2.4 Need to optimize and integrate the health management service model in the central region of Jiangsu

While the central region of Jiangsu has shown good performance in service incentives, its service model capability is lacking. As the core of service provision, service model is the integration of medical institutions at the county, township, and village levels to provide comprehensive, personalized, and continuous health management services with the goal of improving residents' health levels. This is achieved by involving leading hospital experts in primary health management services and ensuring staff and service linkage through institutional collaboration. However, compared to other regions, the central region has weaker vertical collaboration among medical institutions. This is evidenced by the low proportion of leading hospital experts serving as the main leaders of family doctor teams and the limited "one-on-one" diagnosis and treatment services provided to patients with chronic diseases, rehabilitation needs, and special conditions each month. To address this problem, the central region needs to increase the proportion of leading hospital experts in family doctor teams and encourage members at all levels to leverage their functional status and unique advantages to provide differentiated, diversified, and multi-level health management services.

6.2.5 Balanced capacity of the integrated health management services in southern, northern, and central Jiangsu

Integrated health management services rely on effective regulatory feedback mechanisms to sustain their development. According to the analysis of the results, specialized management departments have been established in the three regions to supervise and assess close-knit medical consortiums' quality and quantity of integrated health management services. They prioritize quality control of service processes and outcomes to continually optimize service quality and achieve sustained and positive development of medical communities. Additionally, each medical consortium takes a patient-centric approach to fully understand patients' experiences in receiving integrated health management services and continuously improve their service strategies and processes in response to feedbacks from county residents' actual needs. Notably, among the eight close-knit medical consortiums in this study, only one community in the northern region of Jiangsu conducts regular assessments of family doctor contractors' health status each year, a crucial component of medical community evaluation that objectively and directly assesses the effectiveness of integrated health management. It is recommended that other close-knit medical consortiums improve their assessment system accordingly.

Based on the analysis of the classification of integrated health management in close-knit medical consortiums in the previous section, this study recommends that local governments undertake top-level design and service guarantee measures to further advance the integration of health management in close-knit medical consortiums. This includes prioritizing the development of information technology platforms and facilitating the sharing of residents' health information. It is also essential to focus on establishing sharing mechanisms for high-quality human resources among leading hospitals, while also emphasizing the training and development of primary medical staff to promote "blood transfusion" and "hematopoiesis" in the system. To provide comprehensive and personalized health management services that cover a wide range of needs, close-knit medical consortiums must facilitate vertical staff linkage and horizontal service linkage. Service evaluation should be carried out both from top to bottom and from the bottom up to understand service users' experiences and improve the service delivery process accordingly. Ultimately, these efforts shall lead to a steady improvement in the health level of residents and enhance their overall sense of well-being.

6.3 Discussion on the influencing factors of integrated health management services provided by close-knit medical consortiums on the health of patients with chronic diseases

6.3.1 Improvement of self-management behaviors and overall life quality among groups of patients with chronic diseases

According to the results of descriptive statistics, the self-management behavior and overall life quality of patients with diabetes and hypertension in the intervention group were significantly better than those in the control group. Among the various dimensions of self-management behavior, the diet and medication management of diabetic patients had reached a high level, and there was no significant difference between the intervention and control groups. However, the compliance level of the intervention group in exercise, blood glucose monitoring, and foot care was significantly higher. The compliance level of the intervention group patients with hypertension in medication adherence, hypertension monitoring, and exercise was better than that of the control group, but their compliance levels in dietary control, emotional management, balancing work and rest were worse than those of the control group. In terms of life quality, the various sub-dimensions of diabetic patients' life quality in the intervention group were significantly better than those in the control group. The psychological function of hypertensive

patients in both groups had reached a high level with no significant difference, but the other three dimensions of the intervention group hypertensive patients were significantly better than those of the control group.

Overall, although the self-management behavior and life quality of patients with chronic disease under the integrated health management of the close-knit medical consortium are generally higher, the higher level of patient management in the intervention group than in the control group mainly focuses on items with lower compliance. Therefore, when providing integrated health management, team members should not only focus on helping patients improve those self-management items with poor compliance to fill the gaps but also encourage patients to maintain good self-management items, complement each other's strengths and weaknesses, and help patients improve their self-management level comprehensively.

6.3.2 High coverage and intensity of follow-up services provided by merged integrated medical communities

The intervention group of diabetic patients received health follow-up services within three months, with over 80% of them receiving at least one health follow-up service per month on average. Only a few hypertensive patients did not receive such services during the same period. More than 75% of hypertensive patients received health follow-up services on a monthly basis. Thus, the coverage and intensity of integrated health management follow-up services in the intervention group have reached a relatively high level. The follow-up methods are diverse. The health management team provides health follow-up services to the vast majority of patients with chronic disease by visiting their homes, which reduces indirect medical costs for patients. More than 80% of patients have received health follow-up services in the form of outpatient visits. Since chronic diseases are long-term conditions, patients often need to visit medical institutions for medical treatment or medication purchase, where they can also receive health follow-up services. Remote communication methods are less commonly used. Telephone follow-up is a form of remote follow-up that is not convenient for the health management team members providing patients with disease treatment services, such as blood sugar and blood pressure measurements. This non-face-to-face follow-up method is also not conducive to doctors understanding the degree of patient acceptance of the services. Therefore, the main target of telephone follow-up is chronic disease patients who cannot participate in regular or timely hospital visits due to various reasons (Zhao & Yang, 2016).

6.3.3 Inadequate follow-up care services in the integrated health management of close-knit medical consortiums

Follow-up care services can be categorized into three major types: chronic disease diagnosis and treatment services, disease management plans, and health behavior guidance. During the follow-up process, disease treatment services such as blood pressure and blood sugar measurements are provided in the most comprehensive manner, while health behavior guidance services like persuading patients to adopt a low-salt, low-fat diet are offered the most inadequate. The percentage of patients receiving each health behavior guidance has not yet reached 50% of surveyed patients. Even the proportion of chronic disease patients who receive advice on quitting smoking or drinking is less than 20%. This may be because healthcare providers tend to focus more on providing disease treatment to chronic disease patients during follow-up and overlook patient health education and promotion. Health management teams, on the other hand, tend to directly instruct patients on how to manage their diseases without fully explaining relevant health behavior knowledge related to chronic diseases. The survey results of the status of diabetic patients show poor mastery of diabetes knowledge among patients in the intervention group, which partly indicates that health management teams did not place enough emphasis on health education during the service process. However, the results of self-management among diabetic patients indicate that patients who have a higher level of diabetes knowledge mastery also exhibit better self-management capabilities. Therefore, the health management team needs to strengthen health education during the service process, improve patients' awareness of their diseases, and further guide them to actively engage in self-management, maintain healthy lifestyles, enhance their self-management capabilities, and improve their quality of life.

6.3.4 Enhancement of self-management behaviors and life quality among patients with chronic diseases

The results of a regression analysis on the impact of integrated health management services of close-knit medical consortiums on the self-management behavior of patients with chronic diseases indicate that receiving such services significantly improves the self-management behavior of patients with diabetes and hypertension. Even when other factors were controlled, patients with diabetes and hypertension who receive integrated health management demonstrate higher scores on self-management behavior scales. Closely integrated healthcare management services can break through the limitations of traditionally fragmented services for chronic

diseases. By horizontally combining doctors, nurses, and health workers from different professions, and vertically integrating the collaboration of doctors at three levels (county, town, and village), a team is formed to provide comprehensive health management services to chronic disease patients in the community. This approach integrates prevention, treatment, rehabilitation, and nursing, helping patients with chronic diseases to establish new behaviors and lifestyle habits, and thereby improving their self-management capabilities.

One of the controlled factors is the patients' level of diabetes-related knowledge, which is positively associated with their self-management capabilities. Health knowledge includes a wide range of multidimensional knowledge, such as diabetes diet, treatment, exercise, how to reduce the risks of developing complications and low blood sugar. Mastery of this knowledge can guide and help patients adopt appropriate self-management behaviors. In addition, some studies have suggested that having a good understanding of diabetes can directly or indirectly enhance patients' self-management capabilities (Alexandre et al., 2017). Patients with diabetes who experience high psychological stress tend to exhibit higher compliance with self-management behavior. This may be because when patients clearly perceive the psychological pain caused by diabetes, they are more motivated to engage in self-management activities to reduce their pain and pressure. Surprisingly, self-efficacy is negatively associated with the self-management capabilities of patients with hypertension and diabetes. Patients with high self-efficacy may have poorer self-management capabilities, which is inconsistent with most domestic and foreign research results (Cousin et al., 2020; Luo et al., 2015; Xie et al., 2020) . This phenomenon can be analyzed in the following way: as the subjects of this study, the chronic disease population in rural areas tends to have a limited understanding of chronic diseases and lacks a clear awareness of the challenges involved in effective self-management. They also tend to lack rational confidence in sustaining healthy behaviors. When patients believe that managing their disease is an easy task, they may not devote enough time and effort to learning how to do it properly. With regard to social support, the impact of medical staff support on the self-management capabilities of patients with hypertension and diabetes differs. In the case of hypertensive patients, self-management capabilities tend to improve with an increase in medical staff support. However, in the case of diabetic patients, an increase in medical staff support may actually result in a decrease in self-management capabilities. For hypertensive patients, medical staff can engage in discussions with patients regarding disease treatment, listen to their symptoms, explain laboratory results, and help them understand their health status, thereby increasing their disease-related knowledge. Meanwhile, it is difficult for medical staff to act on behalf of patients with hypertension in their self-management behaviors, as these require

patients to pay attention to and maintain healthy behaviors in their daily lives. Medical staff only plays a guiding role in this regard. Conversely, for diabetes patients, medical staff may perform some self-management behaviors for them, such as foot examinations and blood glucose monitoring. This may lead to patients becoming overly reliant on the medical staff, which can gradually decrease their initiative to carry out these self-management behaviors. Consistent with previous studies (Gunggu et al., 2016; Huang et al., 2014), family, friends, and community support can enhance the self-management capabilities of patients with hypertension and diabetes. Family and friends can accompany patients in exercise and promote healthy behaviors such as low-fat, low-sugar, or low-salt diets, as well as remind them to take medication regularly. Additionally, community facilities can create a conducive atmosphere for patients to exercise and increase their willingness to engage in regular exercise. The income level of patients significantly affects their self-management capabilities, as self-management requires certain economic resources, such as purchasing blood glucose and blood pressure monitors for regular monitoring and wearing comfortable shoes. Studies have shown that this income effect is particularly prominent in dietary management, medication adherence, and self-blood glucose monitoring (Fisher et al., 2005; Kirk et al., 2015; Liu, 2020). While some previous studies suggest that patients with emotional disorders have lower self-management capabilities, diabetic patients with emotional disorders exhibit higher self-management capabilities (Gunggu et al., 2016; Zhang, 2018). However, hypertensive patients with emotional disorders have lower self-management capabilities. When patients have emotional disorders such as anxiety and depression, their psychological state is unstable, and they are more easily influenced by the physiological changes caused by the disease. Patients with emotional disorders allocate a lot of time and energy to disease management to reduce the adverse effects of the disease and prevent various diabetes complications. Furthermore, family and friends of patients with emotional disorders provide more support and help for their emotional care. For hypertensive patients, emotional management is part of their self-management, and having emotional disorders increases the difficulty of their emotional management. Emotion plays a crucial role in blood pressure regulation, and fluctuations in emotional states can significantly impact patients' control of their blood pressure.

Analyzing the impact of integrated health management services provided by a close-knit medical consortium on the life quality of patients with chronic diseases, it can be concluded that receiving such services has a significant positive effect on improving the life quality of both diabetic and hypertensive patients. With other factors constant, the life quality of diabetic and hypertensive patients who receive health management services is better than those who do

not. This is partly due to the fact that the establishment of the integrated health management model has promoted closer cooperation and resource coordination between primary and higher-level medical institutions, whereby patients who are referred for further treatment are given priority and then transferred back to primary care for follow-up management once their condition stabilizes and treatment plans are established. In this way, patients are able to receive timely and appropriate treatment at a lower economic cost. Additionally, the development of unified management plans and methods for the comprehensive prevention and treatment of chronic diseases in the close-knit medical consortium has standardized and homogenized the diagnosis and treatment of chronic diseases, thereby improving the accessibility of high-quality chronic disease services. Furthermore, the improvement of self-management capabilities among patients with chronic disease has further enhanced their life quality.

Among other controlling factors, the more severe the stress and psychological distress experienced by diabetic patients, the lower their life quality. Patients with high self-efficacy in managing hypertension and diabetes generally have better life quality. Patients with high self-efficacy are more capable of implementing self-management behaviors at a high level, slowing the progression of chronic diseases, reducing the risk of complications, and thus maintaining a better quality of life. With regard to social support, the support of medical staff is negatively correlated with the life quality of hypertensive patients. This may be due to the fact that medical staff tends to provide more disease treatment services when a patient's life quality is poor. The support of family and friends is positively correlated with the life quality of hypertensive patients. Firstly, with the help of family and friends, patients are more likely to have higher self-management capabilities, which is beneficial for improving their life quality. Secondly, with the support of family and friends, patients' psychological stress is reduced, and they are less likely to believe that the disease will affect their social relationships. However, diabetic patients who receive better support from family and friends tend to have lower life quality. This may be due to the fact that diabetic complications, such as eye diseases and diabetic foot, can severely affect patients' life quality and reduce their ability to perform daily activities, resulting in increased reliance on family and friends for support. Patients with hypertension and diabetes who receive better social support from their neighborhood experience higher life quality. The encouragement and resources provided by their neighborhood help them to better manage their conditions, leading to an improved quality of life. Additionally, the support of their neighborhood can make patients feel that their social relationships are at a better level. Elderly patients with diabetes and hypertension tend to have a lower quality of life. This can be attributed to various factors, such as limited self-management capabilities due to income and

cognitive limitations (Xie et al., 2020), as well as a tendency to endure their conditions without taking proactive steps. Patients with higher education levels and hypertension generally have better life quality because they have a greater ability to absorb and internalize disease-related information, which enables them to cope better with their condition and improve their life quality. In contrast, high-income patients with diabetes or hypertension tend to have a relatively lower quality of life, which is different from previous research findings (Sun et al., 2016). This may be because the present study focused on chronic disease patients in rural areas, where farming is a major source of income for many patients. Having a higher income may mean that these patients have to invest more time and effort in farming, which places higher demands on their physical fitness and makes them more sensitive to the impact of the disease on their physical functions. Hypertensive patients with emotional disorders tend to have a higher quality of life because they receive more support from their family, friends, and neighborhood in dealing with the disease and mitigating its negative emotional effects on patients. Patients with hypertension who rate their health status as good generally have a higher quality of life because they are more optimistic and proactive. Since blood pressure is easily affected by emotions, optimistic and proactive patients can better manage their emotions and maintain their blood pressure within a normal range.

6.3.5 Enhancement of patients' capability to self-manage their health and improve their life quality

The results of the effect of health follow-up services on the self-management behavior of patients with chronic disease show that the frequency, content, and method of the service are closely related to the self-management behavior of diabetic and hypertensive patients. The analysis results show that patients with chronic disease receive follow-up services with higher frequency have better self-management behavior. The frequency to some extent represents the intensity of patients receiving health follow-up services. When providing health follow-up services, the health management team will provide health education and guidance on patients' health behaviors. With the continuous strengthening of education and guidance, patients with chronic disease can not only consolidate the already mastered health behaviors but also learn more about the precautions. Similar to previous research results, comprehensive health behavior guidance provided in health follow-up services help improve the self-management behavior of diabetic and hypertensive patients (Daniali et al., 2017; Patnode et al., 2017). The more comprehensive the chronic disease diagnosis and treatment services, the lower the self-management capabilities of hypertensive and diabetic patients. This is because patients receive

timely help from medical staff to cope with the disease, they become dependent on the health management team, and the awareness of taking self-management behaviors that are beneficial to disease treatment may gradually fade. The self-management capabilities of hypertensive patients are positively correlated with the disease management plan service they receive, but the diabetic management plan service is negatively correlated with the self-management behavior of the diabetes patients. It is analyzed that for hypertensive patients, the self-management behavior mainly includes diet, medication, emotion control, balancing work and rest, and exercise, which are difficult for medical staff to "take care of" in the process of formulating the disease management plan. For diabetic patients, some self-management behaviors such as foot examinations, can be completed with the help of medical staff after the formulation of the disease management plan. In this regard, hypertensive patients have less dependence on the disease management and will not have negative effects similar to diabetic patients. Receiving telephone follow-up is negatively correlated with the self-management capabilities of diabetic and hypertensive patients. This could be because simple short-time phone communication may not be ideal for establishing a good doctor-patient relationship or providing in-person guidance. This is different from previous research results (Fang et al., 2014).

Patients with diabetes who have received at least three follow-up services in the past three months have been found to have a better life quality with less impact from the disease. This is because the high level of self-management achieved through intensive health follow-up services allows for stable control of blood sugar levels, disease management, prevention of complications, and reduced impact on the quality of life for these patients. On the other hand, high-frequency health follow-up services for hypertensive patients is found to be associated with lower quality of life. It can be analyzed that in cases where blood pressure control is poor, the health management team members may increase the frequency of health follow-up services to provide more intervention, hoping to use their professional knowledge to help patients cope with the difficulties caused by their illness. However, patients with hypertension who receive more disease management plan services also have a lower quality of life. This is because health management team members need to constantly adjust and optimize treatment plans based on their symptoms, hoping to help patients reduce the negative impact of hypertension. Patients with diabetes who receive regular diagnosis and treatment services have a better quality of life as medical professionals provide disease treatment services for them regularly, helping them manage their disease and reducing the impact of diabetes on their quality of life. Patients with diabetes who receive telephone follow-up services have a higher quality of life compared to those who receive outpatient follow-up services. This may be because patients with severe

diabetes and whose quality of life is greatly affected by diabetes often need to go to medical institutions for medical examination, and medical staff usually complete health follow-up services during their medical visits. Patients whose life quality is less affected by diabetes visit medical institutions less frequently and usually do not receive outpatient follow-up services. Medical staff will conduct follow-up checks and provide some remote guidance through telephone calls, reducing the time cost for health management team members to visit patients and improving their work efficiency, while also reducing the time cost for patients to receive follow-up services. There was no significant correlation between home visit follow-up services and the life quality of patients with diabetes or hypertension. This is because over 99% of patients have received home visit follow-up services, and there are very few chronic disease patients who received such services. Therefore, the impact of whether or not patients receive home visit follow-up services on their life quality is weakened. For hypertensive patients, both telephone and outpatient follow-up services are beneficial to improving their life quality.

6.3.6 Other factors affecting self-management behavior and quality of life

The analysis results show that there are differences in the effects of related factors on self-management behavior and quality of life between the patients with chronic disease in the intervention group that received the integrated health management services and the control group.

The self-management capabilities and self-efficacy of patients with hypertension and diabetes in the control group are negatively correlated, while those of patients with hypertension in the intervention group are positively correlated. Patients from rural areas have limited knowledge about their disease, and without rational recognition, their confidence in being able to "overcome" the disease is irrational. With the integration of a close-knit medical consortium, healthcare teams can provide guidance to patients, deepen their understanding of their disease, and help them eliminate irrational confidence. Only with a relatively rational premise can patients establish confidence that is positively correlated with their capabilities of self-management. In terms of social support, the higher the level of support from family and friends for control group patients with diabetes, the better their capabilities of self-management will be. But no such effect was observed in the intervention group. With the integration of a close-knit medical consortium, the support provided by medical staff can offset some of the differences caused by the varying levels of support from family and friends. The capabilities of self-management among elderly patients with hypertension in control group are relatively poor, although not significant in the intervention group. Integrated health management is not only

aimed at patients themselves but also involves communication with family members when providing services. With the help of their families, elderly patients can manage their disease, and internet pharmacies under the close-knit medical consortium can help the elderly obtain the long-term medication they need in a timely manner, thereby eliminating barriers for patients to take drugs according to prescriptions. In the control group, patients with higher education levels have better self-management capabilities, possibly because patients with higher levels of education have better abilities to acquire and internalize knowledge (Alexandre et al., 2017; Ma et al., 2021). However, this difference is not significant under the health management provided by a close-knit medical consortium, as health management teams can serve as a source of information and provide knowledge and skills that can help patients control and treat their diseases, thereby bridging the gap caused by different education levels. Patients with moderate incomes in the control group have poorer self-management capabilities. This is no longer significant in the intervention group, in which patients with higher incomes have better self-management capabilities, indicating that under the guidance of health management teams, patients with diabetes in the intervention group will be relieved from neglecting self-management due to busy work. The self-management capabilities of disabled patients with hypertension in the control group were better, while the opposite was observed in the intervention group. Some disease management for patients who cannot fully take care of themselves is completed with the help of others, who are often healthier and have higher health literacy. Therefore, in the control group, there is a better level of self-management among disabled patients. After receiving integrated health management, patients can self-manage with a positive attitude, correct approaches, and appropriate intensity. Fully self-reliant patients can rely on themselves to complete their self-management and are more likely to fully exert their subjective initiative. If patients cannot live fully self-reliantly, their management will depend on their help provider, resulting in lower capabilities of self-management than those who can fully take care of themselves.

The level of knowledge on diabetes and its correlation with the life quality of patients is an important factor to consider. The results from the intervention group showed a negative correlation, while those from the control group showed the opposite. Previous studies suggested that there was no direct relationship between the level of knowledge of diabetic patients and their life quality (Al-Aboudi et al., 2016; Zabeleta et al., 2010). However, in this study, the reason for this result in the intervention group might be the fact that the health management team tailored the management intensity and content based on the severity of patients' conditions. For those with more severe diabetes, the team increased the management intensity and provided

a more comprehensive management plan, which included more precautions and skills to help them cope with the disease. In the control group, the higher the level of support from the neighborhood community, the better the life quality of the diabetic patients, while the support from medical staff did not have a significant impact on their life quality. On the other hand, in the intervention group, the level of support from the neighborhood community was not significantly correlated with the life quality of the diabetic patients, while the support from medical staff was positively correlated. This might because that under the integrated health management of a close-knit medical consortium, diabetic patients received more comprehensive health management services, and the collaboration between the community and medical staff was closer. The integrated health management was provided by a health management team composed of medical staff from county, township, and village-level medical institutions to provide services to patients. Village-level community health service stations had more contact with patients, and when they discovered that some of their patients' needs could be met through community support, they communicate with the village committee in a timely manner to help patients reduce the negative impact of the disease. Therefore, the impact of medical staff on their life quality was greater.

Chapter 7: Conclusion

7.1 Regional disparities in the capability of integrating health management services among close-knit medical consortium pilot areas in Jiangsu Province

This study shows that the overall ability to integrate health management services among close-knit medical consortiums in the southern region of Jiangsu ranked higher than in central and northern Jiangsu, which can be attributed to the region's higher level of economic development. Firstly, the southern region of Jiangsu has undergone a longer exploration period for close-knit medical consortiums, resulting in a more mature development. Additionally, the government issued many favorable policies tailored to local needs and conditions, based on a careful study of relevant health policy documents issued by national and superior governments. This accelerated the construction and development of local close-knit medical consortiums for integrating health management services. At the same time, the region attaches great importance to the construction and operation of information technology, which is conducive to timely access and sharing of residents' health information and accelerating the pace of integrated health management service delivery. Secondly, internal managers of close-knit medical consortiums have widely promoted the service concept and behavioral values centered on residents' health, and medical staff at all levels of medical institutions have a greater sense of recognition and understanding of integrated health management. Moreover, regions with higher levels of economic development have more complete medical staff salary systems, higher medical standards, better promotion platforms, and medical and health resources, which attract outstanding medical and health staff to concentrate in leading hospitals. In the southern region of Jiangsu, leading hospitals have close cooperation and exchange with primary medical institutions, with rich high-quality human resources from leading hospitals supporting primary medical institutions. In addition, there is a more mature and complete incentive mechanism.

Based on the analysis of the classification results for the integrated health management of close-knit medical consortiums in the previous section, this study recommends several measures to further promote the integration of health management. Firstly, local governments should engage in top-level design to ensure service guarantees for the integration of health

management, particularly in the areas of information platform construction and the sharing of residents' health information. Additionally, there should be an increased focus on strengthening the sharing mechanism of high-quality human resources in leading hospitals, while also prioritizing the training and development of medical staff at the grassroots level. In terms of service delivery, close-knit medical consortiums should offer integrated, comprehensive, personalized, and widely accessible health management service, achieving vertical staff linkage and horizontal service linkage. In terms of service evaluation, it is necessary to adopt top-down supervision and assessment, as well as receive bottom-up feedback from service users. This approach will facilitate timely and comprehensive improvements to integrated health management services. Ultimately, these measures will improve residents' health levels and enhance their overall well-being.

7.2 The integrated health management services within a close-knit medical consortium framework

Integrated health management encompasses a range of services including narrow health management, health promotion and education, and disease prevention and control. While patients with chronic diseases who exhibit poor compliance to self-management behaviors may benefit from integrated health management, those with better or moderate compliance require further guidance. As for the quality of life of patients, diabetes has the greatest impact on patients' physiological function, whereas patients with hypertension have the lowest quality of life in terms of physical function. Patients in rural areas tend to have limited knowledge of diseases, and diabetic patients under integrated health management often have a low level of knowledge mastery. Therefore, when providing integrated health management services, health management teams should prioritize patient education, correcting misconceptions, and encouraging active disease management. In doing so, actual patient compliance should be taken into consideration, while minimizing the physiological impact of the disease and avoiding overly generalized approaches, all with the aim of improving patients' life quality.

7.3 Health education and behavioral guidance in integrated health management follow-up services

The survey shows that behavioral guidance has the lowest coverage among the various follow-up services provided in integrated health management. However, chronic diseases can result

from long-term stress, fatigue, unhealthy lifestyles, poor dietary habits, neglect of self-care, and psychological imbalances. Therefore, patients' health behaviors are crucial in controlling the progression of these diseases. While self-management knowledge of patients with diabetes improves with development of disease knowledge, the mastery level of disease-related knowledge among patients receiving health follow-up services is still relatively low. Thus, it is important that health follow-up services not only provide disease treatment services and help develop disease management plans but also strengthen health behavior guidance and education. This will enable patients to have a correct understanding and a positive attitude, thereby enhancing their self-management awareness and developing healthy lifestyle habits. Only then can patients improve their self-management level, adopt self-management behaviors and healthy lifestyle habits, control blood pressure and blood sugar, and reduce the harm of diseases under this health follow-up service model.

7.4 Social support in the integrated health management model to promote self-management capabilities of chronic diseases

Integrated health management is not solely reliant on the medical staff, but also requires the support and assistance of family, friends, and the community. The family serves as the logistical support in health management and can become an efficient location for health management with the right utilization and implementation of this function. The support and assistance of family and friends are crucial factors that influence the self-management capabilities and life quality of patients with chronic diseases, and family members can also influence each other's habits. Therefore, health education, awareness promotion, and healthy lifestyle guidance within the family are essential. Through community guidance and training in integrated health management, coordination and collaboration between the family and the entire service system can be achieved. Currently, most residents recognize the hazards of chronic diseases and actively cooperate with the establishment of health records, follow-up visits, health education, and promotion in community health service centers. Therefore, community support should be encouraged, and facilities such as exercise venues should be provided to fully leverage the community's supportive role and offer patients more opportunities to access disease and health-related knowledge, as well as the conditions for achieving better health.

7.5 Population health through enhanced collaboration among medical institutions within a close-knit medical consortium community

In a close-knit medical consortium, integrated health management can promote self-management capabilities and improve the life quality for patients with chronic diseases. To fully realize the potential of integrated health management in improving population health, it is necessary to strengthen the collaboration among medical institutions within the medical consortium and coordinate and integrate various health resources to provide residents with integrated, comprehensive, personalized, and widely accessible health management services. Firstly, enhancing collaboration between medical staff at the county, town, and village levels through targeted assistance can improve the service capabilities of primary medical institutions and increase access to high-quality medical services within the medical consortium. Secondly, the provision of integrated health management services requires the participation of medical institutions at different levels in the county. The health management team integrates county-level specialists, town-level general practitioners, family doctors, and public health doctors to ensure targeted and professional delivery of services. Moreover, the health management model is oriented toward resident health rather than disease and offers residents treatment, prevention, care, and rehabilitation services based on their health service needs. Through diversified health services within the medical consortium, residents' health needs can be met to the greatest extent possible, resulting in an overall improvement in their health levels.

7.6 Limitations and Prospects

One limitation of this study is that its empirical component for effect evaluation relies on cross-sectional data, which may not capture the dynamics and changes within the integrated health management service model over time. This could potentially limit the depth of insight into the long-term effectiveness and sustainability of the model. To address this limitation, future research could consider incorporating longitudinal data to provide a more comprehensive understanding of the evolution and impact of the integrated health management service model. Additionally, the interviews were not conducted with government departments such as finance, health insurance, and health, and the scope of respondents could be expanded in the future, expanding the scope of interviewees, which may provide a more holistic perspective on the effectiveness and challenges of the model. This could contribute to a more robust and nuanced understanding of the close-knit medical consortium and its implications for healthcare delivery.

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Annex A: Interview Outline

Interview outline for the evaluation of integrated services in the close-knit medical consortium

Outline 1 - Interview outline for the County People's Hospital administrator

Interviewee: Management staff of the County People's Hospital

1. Can you introduce the overall situation of the construction of the medical consortium, the difficulties and problems encountered during the work process?

   Key points of inquiry: The starting year and implementation of the construction of the medical consortium (focusing on the policies of hierarchical diagnosis and treatment, medical communities, family doctors and self-developed regulations, highlights and characteristics), difficulties and problems encountered during the construction process (policy implementation and specific implementation barriers, which independent powers need to be opened up to be more beneficial to the construction of the medical consortium) can be illustrated by examples.

2. What specific and effective measures have been taken in the construction of the medical consortium, and what are the results?

   Key points of inquiry: Specific effective measures taken in the construction of the medical consortium (corporate structure and management operation mechanism, personnel establishment, salary and incentive mechanism, medical insurance payment, price reform, and others). What are the characteristics and targeted measures of community construction in terms of responsibility, interests, service, and management? How has the basic medical service, basic public health service, and health management service capabilities and levels improved in the medical consortium? What is the situation of talent introduction and masses training?

3. What are the goals and specific requirements of the county for the construction of the medical consortium? What is the overall service capacity and level of the medical consortium? What are the difficulties and shortcomings?

   Key points of inquiry: The overall goals and specific requirements of the construction, what are the tasks to be carried out, what are the characteristic works and highlights? What are the key tasks and effectiveness of the construction, which areas need significant

improvement? Has the construction met the work requirements, and what areas still need to be improved and perfected?

4. What specific measures have been taken in government promotion, organizational structure (corporate governance), medical insurance support, incentive mechanism, information and data management, online linkage, and talent team development in the construction of the medical consortium? What are the results?

    Key points of inquiry: Measures taken for the development of primary health staff team (whether there are incentive measures such as establishment, salary, and value recognition), talent training should include the ability improvement strategy (pay attention to reminding them to answer local characteristics), talent training measures (training, job promotion), other incentive mechanisms.

5. What are the main problems faced in improving the medical and health service capabilities in the process of building the medical consortium? What is the focus of attention? Which aspects of basic medical services, basic public health services, and health management services need to be improved? What conditions are needed to support the improvement of these capabilities?

    Key points of inquiry: What are the main problems faced in improving the medical and health service capabilities (from the aspects of basic medical, basic public health, health management, health literacy, organizational management, and professional literacy capabilities)?

6. Has the process supervision and effectiveness evaluation of the construction of the medical consortium been carried out? How was it carried out?

7. As the head of the leading hospital, how do you define the integrated health management service model? Can you discuss several aspects such as service guarantee, service guidance between the three levels of counties, townships and villages, service provision, and evaluation of service effectiveness? What measures have been implemented so far? How was the progress, and implementation effectiveness?

Outline 2 - Interview outline for administrators of primary medical institutions

Interviewee: Administrator of township health center

1. Please introduce the basic information of your unit, including the construction of the medical consortium and the implementation of family doctor contract services.

    Key points of inquiry: Please provide the basic information, including the composition of personnel (permanent staff, contract staff, professional titles), the number of beds, daily outpatient visits, hospitalizations, and the status of medical services (such as chronic disease management, surgeries and others). Please also provide information on the

implementation of family doctor contract services (number of signed contracts, compliance status and rate, service package).

2. What specific measures have been taken to promote the construction of the close-knit medical consortium and related business cooperation? What are the forms of cooperation (such as remote consultations, professional consultations, hospital-embedded doctors and others)? What are the impacts of these collaborations on your unit's work?

    Key points of inquiry: What is the current status and effectiveness of the medical consortium construction? What are the positive impacts and difficulties, and problems these measures have had on your unit? Have these measures helped improve the basic medical services, basic public health services, and health management services of your unit?

3. What are the main factors affecting the construction of the medical consortium? What effective measures have been taken by the county health committee, County People's Hospital, and your unit to promote the construction? What are the results?

    Key points of inquiry: What are the factors affecting the construction, such as policy, institutional, or internal factors? What effective measures have been taken by the county health committee, County People's Hospital, and your unit to promote the construction? Have any difficulties been encountered during the implementation? What are these difficulties? Can you provide some examples? How effective have these measures been in promoting the construction? Have they enhanced the capabilities and levels of primary medical and health services, basic public health services, and health management services? Have they promoted the implementation of a hierarchical diagnosis and treatment system? Have they improved the capacity and level of medical and health services at the county level? Have they achieved the goals of localized medical treatment and comprehensive and full-cycle health management?

4. Since the establishment of the medical consortium, in what ways have the improvements in your unit's services, management, and benefits been reflected? Can your unit's service capabilities and levels meet the actual needs of the residents in the jurisdiction? What shortcomings, difficulties, and problems still exist?

5. What is the current situation of Personnel establishment and personnel allocation in your unit? How stable are the personnel and family doctor teams? What role does the construction of medical alliances play in attracting talent and effectively mobilizing the enthusiasm of family doctors?

6. What are the effects of the medical consortium construction on promoting the implementation of the hierarchical diagnosis and treatment system? If we were to establish

a system of family doctors as health guardians, which mandates family doctors to take on responsibilities such as the first diagnosis and decision-making for referral of residents, what are the main problems facing our current family doctor team? Can the medical consortium provide effective solutions to these problems?

7. As the administrator of a primary medical institution in a close-knit medical consortium, how would you define an integrated health management service model? What integrated health management services have been provided by your primary medical institution? What are the effects? Have any goal management and specific assessment indicators been implemented for the health management services currently provided? What guidance and assistance has the higher-level hospital provided to the primary medical institution for the implementation of health management services? What problems do you think still exist in the implementation of health management services at the grassroots level?

Outline 3 - Interview outline for family doctor team

Interviewee: Administrator of health management team at county hospital

1. Please provide a brief introduction of your team and the health management services you offer.

    Key points of inquiry: The number and composition of the team members, their professional titles and responsibilities, the content of health management services, and the specific situation of family doctor services, including the number of signed patients, compliance status and rate, the frequency and content of services provided, and the level of resident satisfaction.

2. What tasks do you mainly undertake as the administrator of the health management team, as required by relevant departments? Does your team have clear division of responsibilities and standardized documentation? What are the main difficulties in carrying out these tasks, and how does your team overcome them?

    Key points of inquiry: What are the tasks assigned by the relevant departments to family doctors? What are the main challenges encountered in the implementation of these tasks (such as policy support, grassroots working conditions, family doctors' personal abilities, personal initiative and others)? Can you provide examples from your personal experience? How does your team address these challenges, and what is the gap between the current abilities of family doctors and the requirements of relevant departments?

3. As the administrator of the health management team, what training and guidance do you provide to staff in your team? What are the current health management service projects implemented by your team (such as the concept of medical and prevention integration, chronic disease prevention and control management, rehabilitation patient management

and others)? Are there specific health management target systems and phased task indicators? How effective are the health management projects and are the goals being met? Please provide specific examples (such as resident health status).

4. How do you assess the performance of your team members? Do you have relevant documents? What methods and indicators are used, and are they detailed and quantitative (such as differentiating the equivalent workload of doctors' telephone follow-up, clinic follow-up, and home visit follow-up)? How often is performance evaluated, and are there any corresponding reward or punishment measures? Please provide specific examples.

5. What is the current composition of your team members (educational background, professional qualifications, and other skill sets)? Can the current level of personnel meet the requirements for implementing health management projects? Are there any difficulties in attracting and retaining general practitioners, and how do you address them? What assistance do you need?

6. Is there a dedicated health management department established? Who is in charge of management? Are there any health management services or models designed with local characteristics (such as integrating Chinese and Western medicine for health management in some areas)?

7. What is the source of funding for the health management project? How much funding is available, how is it allocated, and is it sufficient? What happens if it is not enough, and what difficulties do you face?

8. Have you provided systematic training on health management to your team? What does the training involve? Is there a regulation requiring leading hospitals to provide guidance to township health centers? Are there any relevant documents, and are there specific requirements for the content and frequency of such guidance?

Outline 4 - Interview outline for family doctor team

Interviewees: Family doctor team from township health center

1. Please briefly introduce your team and the situation of your family doctor services.

   Key points of inquiry: Number of members, composition, titles, and division of responsibilities. Specifics of family doctor services, such as the number of signed residents, compliance status and rate, service content and frequency, and resident satisfaction.

2. According to the requirements of relevant departments, what tasks do family doctors undertake? What are the main difficulties encountered in fulfilling these tasks? How do you overcome these difficulties in your daily work?

   Key points of inquiry: Tasks required by relevant departments and main difficulties encountered in fulfilling them (including policy support, grassroots working conditions,

personal abilities, and personal initiative). Can you provide examples based on actual experiences? Can you describe how these difficulties are overcome to further understand the gap between the current level of family doctor ability and the requirements of relevant departments?

3. How welcome is your team's service when offering family doctor services to residents who have signed contracts? What are the areas where residents are dissatisfied? What are the reasons for their dissatisfaction?

   Key points of inquiry: Evaluate the popularity of the team and members based on residents' feedback on the team's work. Describe the specific scenarios where residents are dissatisfied with family doctor services (such as content of family doctor signing services, personal abilities of family doctors, service methods, attitudes and others), focus on the reasons for their dissatisfaction and the improvement requirements and suggestions they propose.

4. When handling health problems for signed residents or other residents in your daily work, how do you deal with clinical problems that you cannot solve? Can you obtain support and help from higher-level hospitals or other sources in a timely manner? If so, what methods are generally used to obtain support? What are the situations that require seeking help?

   Key points of inquiry: Provide examples of clinical problems that could not be solved in daily work when handling health problems for signed residents or other residents, the reasons for inability to solve them (insufficient conditions or ability), and the handling methods used. In such situations, is it possible to obtain support and assistance from higher-level hospitals or other sources, and how can it be obtained? What are the circumstances that require seeking help?

5. What difficulties or expectations do you have in your work and life? In order to ensure that a qualified family doctor can serve at the grassroots level, what conditions or policy support do you think the government, units, and others need to provide?

   Key points of inquiry: Describe the difficulties encountered in work and life, the reasons for the difficulties, and the support and help expected, including what aspects of conditions or policy support the government, units and others need to provide to ensure that a qualified family doctor can serve at the grassroots level.

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Annex B: Expert Consultation Form (Round One)

Expert consultation form for evaluation index system of integrated health management in close-knit medical consortium (Round 1)

Part 1: Basic information questionnaire for experts

【**Instructions**】

For fill-in-the -blank questions, please fill in the answer directly in "_____".

For multiple-choice questions, please fill in the number of the chosen answer in "(   )" after the question. (All questions are single-choice questions.)

For open-ended questions, please write the answer in "_____".

1. Your name: _____

2. Your workplace: _____

3. Your gender: (   )　①Male　②Female

4. Your age: (   )　①＜30　② 30~39　③ 40~49　④ 50~59　⑤≥60

5. Your main job: (   )

① Healthcare administration　② Clinical work　③ Public health　④ Health management　⑤Hospital management

⑥Other_____

6. Your education: (   )　①Associate degree　②Bachelor's degree　③Master's degree ④Doctoral degree or above　⑤Other_____

7. Your professional title: (   )　①Professor　②Associate professor　③Intermediate title　④Primary title　⑤No professional title

8. Total years of work experience so far: _____. Your years of work experience in your current main professional field (if you work in multiple fields, please specify the years of work experience in your two main fields):

(1) Professional field _____

Years of experience: _____years

(2) Professional field _____

Years of experience: _____years

Part 2: Expert consultation form for evaluation indicators of integrated health management services in close-knit medical consortium

Table b.1: First-level Indicators Evaluation Form

First-level Indicators	Importance （1-10）	Operability （1-10）	Effectiveness （1-10）	Remarks
				Suggestions for modification or deletion
Service guarantee				
Service guidance				
Service provision				
Service evaluation				
Other indicators (if any, please provide)				

Table b.2: Second-level Indicators Evaluation Form

First-level Indicators	Second-level Indicators	Importance （1-10）	Operability （1-10）	Effectiveness （1-10）	Whether it belongs to this category of indicators		Remarks
					Yes	No	Suggestions for modification or deletion
Service guarantee	1 Shared vision						
	2 Policy support						
	3 Payment guarantee						
	4 Information construction						
	Other indicators (if any, please provide)						
Service guidance	5 Technical guidance						
	6 Training and exchange						
	Other indicators (if any, please provide)						
Service provision	7 Integration of medical and preventive services						

First-level Indicators	Second-level Indicators	Importance （1-10）	Operability （1-10）	Effectiveness （1-10）	Whether it belongs to this category of indicators		Remarks
					Yes	No	Suggestions for modification or deletion
	8 Service model						
	9 Service motivation						
	Other indicators (if any, please provide)						
Service evaluation	10 Assessment and supervision						
	11 Feedback mechanism						
	Other indicators (if any, please provide)						

Table b.3: Third-level Indicators Evaluation Form

First-level indicators	Second-level indicators	Third-level indicators	Importance（1-10）	Operability（1-10）	Effectiveness（1-10）	Whether it belongs to this category of indicators		Remarks
						Yes	No	Suggestions for modification or deletion
Service guarantee	Shared vision	1 Sense of belonging and recognition of medical consortium among members of the close-knit medical consortium						
		2 Consistent medium- and long-term development goals established by the close-knit medical consortium						
		Other indicators (if any, please provide)						
	Policy support	1 Implementation plan for the construction of close-knit medical consortium						
		2 Policy on differentiated medical insurance reimbursement within the close-knit medical consortium						
		3 Policy on prepayment and retention of surplus medical insurance funds						

First-level indicators	Second-level indicators	Third-level indicators	Importance （1-10）	Operability （1-10）	Effectiveness （1-10）	Whether it belongs to this category of indicators		Remarks
						Yes	No	Suggestions for modification or deletion
		4 Institutional system for quality management and bidirectional referral in the close-knit medical consortium						
		5 Policy on physicians' free practice in any medical institution within the close-knit medical consortium						
		6 Scheme for guiding the close-knit medical consortium to provide continuous diagnosis, treatment, rehabilitation and long-term care services for patients						
		7 Implementation of health education policies, such as long prescription and extended prescription, for chronic disease contracted patients						

First-level indicators	Second-level indicators	Third-level indicators	Importance （1-10）	Operability （1-10）	Effectiveness （1-10）	Whether it belongs to this category of indicators		Remarks
						Yes	No	Suggestions for modification or deletion
		8 Policy on medical insurance benefits for referral patients within the close-knit medical consortium						
		Other indicators (if any, please provide)						
	Payment guarantee	1 Average proportion of government health service investment in regular fiscal expenditures in the past three years						
		2 Average proportion of government investment in the medical consortium to total medical consortium revenue in the past three years						
		3 Per capita health service expenditure						
		4 Per capita basic public health subsidies						
		Other indicators (if any, please provide)						

First-level indicators	Second-level indicators	Third-level indicators	Importance（1-10）	Operability（1-10）	Effectiveness（1-10）	Whether it belongs to this category of indicators		Remarks
						Yes	No	Suggestions for modification or deletion
	Information construction	1 Mutual recognition of inspection and test results between county and township-level medical institutions within the close-knit medical consortium						
		2 Establishment and effective operation of remote medical system between leading hospitals and township health centers within the close-knit medical consortium						
		3 Average monthly number of remote consultations within the close-knit medical consortium						
		4 Implementation of continuous records of electronic health records and electronic medical records within the close-knit medical consortium						

First-level indicators	Second-level indicators	Third-level indicators	Importance（1-10）	Operability（1-10）	Effectiveness（1-10）	Whether it belongs to this category of indicators		Remarks
						Yes	No	Suggestions for modification or deletion
		5 Degree of sharing of residents' health information within the close-knit medical consortium						
		Other indicators (if any, please provide)						
Service guidance	Technical guidance	1 The number of township health centers that are assisted within the close-knit medical consortium system						
		2 The number of village clinics that are assisted within the close-knit medical consortium system						
		3 The situation of clinical teaching, teaching rounds, health education technical guidance, specialty construction, new technologies, and new projects carried out						

First-level indicators	Second-level indicators	Third-level indicators	Importance （1-10）	Operability （1-10）	Effectiveness （1-10）	Whether it belongs to this category of indicators		Remarks
						Yes	No	Suggestions for modification or deletion
		by leading hospitals to support primary medical institutions each year						
		4 The person-times professional technical personnel from leading hospitals are stationed to guide primary medical institutions each year						
		5 The person-times senior medical experts with advanced professional titles from leading hospitals participate in outpatient clinics, rounds, and consultations (including remote consultations) at primary medical institutions each year						
		Other indicators (if any, please provide)						

First-level indicators	Second-level indicators	Third-level indicators	Importance（1-10）	Operability（1-10）	Effectiveness（1-10）	Whether it belongs to this category of indicators		Remarks
						Yes	No	Suggestions for modification or deletion
	Training and exchange	1 The number of free training sessions conducted by leading hospitals for primary medical institutions each year						
		2 The person-times primary medical institutions send staff to study and further their education at leading hospitals each year						
		3 The person-times primary medical institutions go to leading hospitals for more than three months of further education each year						
		4 Establish a weekly meeting system within the close-knit medical consortium						
		5 The number of pairs of mentor-mentee relationships established between						

First-level indicators	Second-level indicators	Third-level indicators	Importance（1-10）	Operability（1-10）	Effectiveness（1-10）	Whether it belongs to this category of indicators		Remarks
						Yes	No	Suggestions for modification or deletion
		physicians from leading hospitals and physicians from primary medical institutions						
		6 Establish a timely communication mechanism between county-level experts and primary care doctors, general practitioners						
		Other indicators (if any, please provide)						
Service provision	Integration of medical and preventive services	1 Coverage rate of family doctor contract services for key populations within the close-knit medical consortium						
		2 The percentage of residents who have established personal health records in the close-knit medical consortium						

First-level indicators	Second-level indicators	Third-level indicators	Importance （1-10）	Operability （1-10）	Effectiveness （1-10）	Whether it belongs to this category of indicators		Remarks
						Yes	No	Suggestions for modification or deletion
		3 The number of general practitioners per 10,000 people						
		4 The number of public health doctors per 10,000 people						
		Other indicators (if any, please provide)						
	Service model	1 Implementation of a comprehensive county-wide health check-up service						
		2 Screening for high-risk populations (mainly for hypertension, diabetes, cardiovascular and cerebrovascular diseases, respiratory diseases, stroke, and cerebral infarction)						
		3 Experts from the leading hospital serve as the main responsible persons in the family doctor team						

First-level indicators	Second-level indicators	Third-level indicators	Importance （1-10）	Operability （1-10）	Effectiveness （1-10）	Whether it belongs to this category of indicators		Remarks
						Yes	No	Suggestions for modification or deletion
		4 Establishment of mobile pharmacies for common and chronic diseases within the close-knit medical consortium						
		5 Family doctor teams develop differentiated service plans based on the health status of signed patients						
		6 Family doctor teams develop personalized service plans for the elderly, children, pregnant women, and people with disabilities.						
		7 Monthly home visits by the family doctor team leader to manage high-risk populations						

First-level indicators	Second-level indicators	Third-level indicators	Importance（1-10）	Operability（1-10）	Effectiveness（1-10）	Whether it belongs to this category of indicators		Remarks
						Yes	No	Suggestions for modification or deletion
		8 Monthly disease monitoring and medication guidance for chronic disease patients by the family doctor team						
		9 Monthly health education and policy promotion for signed patients by the family doctor team						
		10 Monthly one-on-one diagnosis and treatment services provided by experts from the leading hospital to chronic disease, rehabilitation, or other special patients						
		Other indicators (if any, please provide)						
	Service motivation	1 Implementation of a fair and reasonable distribution system for medical insurance surplus funds						

First-level indicators	Second-level indicators	Third-level indicators	Importance （1-10）	Operability （1-10）	Effectiveness （1-10）	Whether it belongs to this category of indicators		Remarks
						Yes	No	Suggestions for modification or deletion
		2 Ratio of average income of intermediate professional title staff between the leading hospital and primary medical institutions						
		3 Daily average subsidy amount for dispatched experts from the leading hospital (considering performance assessment for dispatched experts)						
		4 Subsidies for medical consortium members who visit higher-level medical institutions for exchange and learning, based on the number of visits						
		5 Subsidies for family doctor team members for each home follow-up visit						
		Other indicators (if any, please provide)						

First-level indicators	Second-level indicators	Third-level indicators	Importance（1-10）	Operability（1-10）	Effectiveness（1-10）	Whether it belongs to this category of indicators		Remarks
						Yes	No	Suggestions for modification or deletion
Service evaluation	Assessment and supervision	1 Establishment of a dedicated management department for the close-knit medical consortium, conducting regular assessments of medical services and quality at primary medical institutions						
		2 Frequency of regular evaluation for the family doctor team each year						
		3 Regularly assess the primary diagnosis rate and referral rate at the grassroots level						
		4 Regularly assess the service volume of the family doctor team						
		5 Regularly evaluate the health knowledge awareness rate of the population who have contracted with family doctors						

First-level indicators	Second-level indicators	Third-level indicators	Importance （1-10）	Operability （1-10）	Effectiveness （1-10）	Whether it belongs to this category of indicators		Remarks
						Yes	No	Suggestions for modification or deletion
		6 Regularly investigate the improvement of the health level of the population who have contracted with family doctors.						
		Other indicators (if any, please provide)						
	Feedback mechanism	1 Smoothness of feedback channels for members of the close-knit medical consortium						
		2 Outpatient experiences of medical and health service collaboration within the close-knit medical consortium						
		3 Inpatient experiences of medical and health service collaboration within the close-knit medical consortium						
		Other indicators (if any, please provide)						

Part 3: Expert authority quantification table

Table b.4: Familiarity level of primary indicators

Indicator	Level of familiarity				
	Very familiar	Familiar	Moderate	Unfamiliar	Very unfamiliar
Service guarantee					
Service guidance					
Service provision					
Service evaluation					

Table b.5: Judgment Criteria of First-level Indicators

Criteria	Theoretical analysis			Practice experience			Domestic and foreign references			Intuitive judgement		
Impact level	Large	Medium	Small	Large	Medium	Small	Large	Medium	Small	Large	Medium	Small
Service guarantee												
Service guidance												
Service provision												
Service evaluation												

Opinions or suggestions: _____

_____

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Annex C: Expert Consultation Form (Round 2)

Evaluation indicators system for integrated health management in close-knit medical consortium - Expert consultation form (Round 2)

Part 1: Table of evaluation indicators system for integrated health management in close-knit medical consortium

Table c.1: First-level Indicators Consultation Form

First-level indicators	Importance			Operability			Effectiveness			Other suggestions or recommendations for modifications
	Round 1		Round 2	Round 1		Round 2	Round 1		Round 2	
	X	SD	1-10	X	SD	1-10	X	SD	1-10	
Service guarantee	8.33	0.900		8.13	0.915		8.40	0.828		
Service guidance	9.53	0.640		9.27	0.594		9.60	0.507		
Service provision	9.73	0.458		9.40	0.632		10.00	0.000		
Service evaluation	8.67	0.724		8.80	0.561		8.73	0.704		

Note: "X" refers to the mean value and "SD" refers to the standard deviation.

Table c.2: Second-level Indicators Consultation Form

First-level indicators	Second-level indicators	Importance						Operability						Effectiveness						Other suggestions or recommendations for modifications
		Round 1		Round 2				Round 1		Round 2				Round 1		Round 2				
		X	SD	1-10				X	SD	1-10				X	SD	1-10				
Service guarantee	Shared vision	7.53	1.246					7.13	1.187					7.67	1.345					
	Policy support	9.33	0.617					9.07	0.961					8.53	1.302					
	Payment guarantee	8.93	0.884					9.13	0.352					8.73	1.033					
	Information construction	8.73	0.704					8.67	0.9					8.6	0.91					
Service guidance	Technical guidance	9.87	0.352					9.6	0.507					9.4	0.632					
	Training and exchange	8.87	0.834					8.33	0.816					8.8	1.014					
Service provision	Integration of medical and preventive services	8.2	1.014					8	0.926					8.27	1.163					
	Service model	9.93	0.258					9.6	0.632					9.67	1.047					
	Service motivation	8.67	1.175					8.07	1.1					8.87	0.743					
Service evaluation	Assessment and supervision	9.4	0.507					9.13	0.516					9	0.655					
	Feedback mechanism	8.2	0.862					7.93	1.163					8	0.845					

Table c.3: Third-level Indicators Consultation Form

First-level indicators	Second-level indicators	Third-level indicators	Importance			Operability			Effectiveness		
			Round 1		Round 2	Round 1		Round 2	Round 1		Round 2
			X	SD	1-10	X	SD	1-10	X	SD	1-10
Service guarantee	Shared vision	1 Sense of belonging and recognition of medical consortium among members of the close-knit medical consortium	8.27	1.28		7.67	1.175		8	1.309	
		2 Consistent medium- and long-term development goals established by the close-knit medical consortium	9.47	0.516		8.93	0.704		9.47	0.516	
	Policy support	1 Implementation plan for the construction of close-knit medical consortium	8.47	0.915		8.4	1.242		8.27	1.1	
		2 Policy on differentiated medical insurance reimbursement within the close-knit medical consortium	8.2	0.941		8.13	0.99		8.13	1.06	
		3 Policy on prepayment and retention of surplus medical insurance funds	9.07	0.704		8.93	0.704		9.33	0.724	
		4 Institutional system for quality management and bidirectional referral in the close-knit medical consortium	9.2	0.676		9	0.655		9.07	0.704	
		5 Policy on physicians' free practice in any medical institution within the close-knit medical consortium	8.8	0.775		8.2	1.207		8.67	0.9	
		6 Scheme for guiding the close-knit medical consortium to provide continuous diagnosis, treatment, rehabilitation and long-term care services for patients	9.73	0.458		9.53	0.834		9.6	0.632	
		7 Implementation of health education policies, such as long prescription and extended prescription, for chronic disease contracted patients	8.53	0.834		8.4	1.183		8.13	0.915	

First-level indicators	Second-level indicators	Third-level indicators	Importance					Operability					Effectiveness				
			Round 1		Round 2			Round 1		Round 2			Round 1		Round 2		
			X	SD	1-10			X	SD	1-10			X	SD	1-10		
		8 Policy on medical insurance benefits for referral patients within the close-knit medical consortium	8	0.756				8.27	0.961				7.6	0.632			
	Payment guarantee	1 Average proportion of government health service investment in regular fiscal expenditures in the past three years	8.87	1.187				8.53	1.06				8.8	1.265			

Part 2: Expert evaluation table for weighting evaluation indicators of integrated health management services in a close-knit medical consortium

Table c.4. importance rating scale meanings

Importance scale	
1	Two indicators are equally important.
3	The indicator on the left is slightly more important than the one above it.
5	The indicator on the left is significantly more important than the one above it.
7	The indicator on the left is strongly more important than the one above it.
9	The indicator on the left is extremely more important than the one above it.
2,4,6,8	The intermediate values of the above judgments.
Reciprocal	If the importance ratio between element i and element j is A_{ij}, then the importance ratio between element j and element i is $1/A_{ij}$.

Table c.5: First-level indicators discrimination

	Service guarantee	Service guidance	Service provision	Service evaluation
Service guarantee	1			
Service guidance	——	1		
Service provision	——	——	1	
Service evaluation	——	——	——	1

Table c.6: Second-level indicators discrimination

Service guarantee	Shared vision	Policy support	Payment guarantee	Information construction
Shared vision	1			
Policy support	——	1		
Payment guarantee	——	——	1	
Information construction	——	——	——	1

Table c.7: Second-level indicators discrimination

Service guidance	Technical guidance	Training and exchange
Technical guidance	1	
Training and exchange	——	1

Table c.8: Second-level indicators discrimination

Service provision	Integration of medical and preventive services	Service model	Service motivation
Integration of medical and preventive services	1		
Service model	——	1	
Service motivation	——	——	1

Table c.9: Second-level indicators discrimination

Service evaluation	Assessment and supervision	Feedback mechanism
Assessment and supervision	1	
Feedback mechanism	——	1

Table c.10: Third-level indicators discrimination

Shared vision	Sense of belonging and recognition of medical community among members of the close-knit medical consortium	Consistent medium- and long-term development goals established by the close-knit medical consortium
Sense of belonging and recognition of medical community among members of the close-knit medical consortium	1	
Consistent medium- and long-term development goals established by the close-knit medical consortium	———	1

Table c.11: Third-level indicators discrimination

Policy support	Implementation plan for the construction of close-knit medical consortium	Policy on differentiated medical insurance reimbursement within the close-knit medical consortium	Policy on prepayment and retention of surplus medical insurance funds	Institutional system for quality management and bidirectional referral in the close-knit medical consortium	Policy on physicians' free practice in any medical institution within the close-knit medical consortium	Scheme for guiding the close-knit medical consortium to provide continuous diagnosis, treatment, rehabilitation and long-term care services for patients	Implementation of health education policies, such as long prescription and extended prescription, for chronic disease contracted patients	Policy on medical insurance benefits for referral patients within the close-knit medical consortium
Implementation plan for the construction of close-knit medical consortium	1							
Policy on differentiated medical insurance reimbursement within the close-knit medical consortium	——	1						
Policy on prepayment and retention of surplus medical insurance funds	——	——	1					

Policy support	Implementation plan for the construction of close-knit medical consortium	Policy on differentiated medical insurance reimbursement within the close-knit medical consortium	Policy on prepayment and retention of surplus medical insurance funds	Institutional system for quality management and bidirectional referral in the close-knit medical consortium	Policy on physicians' free practice in any medical institution within the close-knit medical consortium	Scheme for guiding the close-knit medical consortium to provide continuous diagnosis, treatment, rehabilitation and long-term care services for patients	Implementation of health education policies, such as long prescription and extended prescription, for chronic disease contracted patients	Policy on medical insurance benefits for referral patients within the close-knit medical consortium
Institutional system for quality management and bidirectional referral in the close-knit medical consortium	——	——	——	1				
Policy on physicians' free practice in any medical institution within the close-knit medical consortium	——	——	——	——	1			
Scheme for guiding the close-knit medical consortium to provide continuous	——	——	——	——	——	1		

Policy support	Implementation plan for the construction of close-knit medical consortium	Policy on differentiated medical insurance reimbursement within the close-knit medical consortium	Policy on prepayment and retention of surplus medical insurance funds	Institutional system for quality management and bidirectional referral in the close-knit medical consortium	Policy on physicians' free practice in any medical institution within the close-knit medical consortium	Scheme for guiding the close-knit medical consortium to provide continuous diagnosis, treatment, rehabilitation and long-term care services for patients	Implementation of health education policies, such as long prescription and extended prescription, for chronic disease contracted patients	Policy on medical insurance benefits for referral patients within the close-knit medical consortium
diagnosis, treatment, rehabilitation and long-term care services for patients								
Implementation of health education policies, such as long prescription and extended prescription, for chronic disease contracted patients	___	___	___	___	___	___	1	
Policy on medical insurance benefits for referral patients within the close-knit medical	___	___	___	___	___	___	___	1

Policy support	Implementation plan for the construction of close-knit medical consortium	Policy on differentiated medical insurance reimbursement within the close-knit medical consortium	Policy on prepayment and retention of surplus medical insurance funds	Institutional system for quality management and bidirectional referral in the close-knit medical consortium	Policy on physicians' free practice in any medical institution within the close-knit medical consortium	Scheme for guiding the close-knit medical consortium to provide continuous diagnosis, treatment, rehabilitation and long-term care services for patients	Implementation of health education policies, such as long prescription and extended prescription, for chronic disease contracted patients	Policy on medical insurance benefits for referral patients within the close-knit medical consortium
consortium								

Table c.12: Third-level indicators discrimination

Payment guarantee	Average proportion of government health service investment in regular fiscal expenditures in the past three years	Average proportion of government investment in the medical consortium to total medical consortium revenue in the past three years	Per capita basic public health subsidies
Average proportion of government health service investment in regular fiscal expenditures in the past three years	1		
Average proportion of government investment in the medical consortium to total medical consortium revenue in the past three years	——	1	
Per capita basic public health subsidies	——	——	1

Table c.13: Third-level indicators discrimination

Information construction	Mutual recognition of inspection and test results between county and township-level medical institutions within the close-knit medical consortium	Establishment and effective operation of remote medical system between leading hospitals and township health centers within the close-knit medical consortium	Average monthly number of remote consultations within the close-knit medical consortium	Implementation of continuous records of electronic health records and electronic medical records within the close-knit medical consortium	Degree of sharing of residents' health information within the close-knit medical consortium
Mutual recognition of inspection and test results between county and township-level medical institutions within the close-knit medical consortium	1				
Establishment and effective operation of remote medical system between leading hospitals and township health centers within the close-knit medical consortium	——	1			

Average monthly number of remote consultations within the close-knit medical consortium	――	――	1		
Implementation of continuous records of electronic health records and electronic medical records within the close-knit medical consortium	――	――	――	1	
Degree of sharing of residents' health information within the close-knit medical consortium	――	――	――	――	1

Table c.14: Third-level indicators discrimination

| Technical guidance | The number of township health centers that are assisted within the close-knit medical consortium system | The situation of clinical teaching, teaching rounds, health education technical guidance, specialty construction, new technologies, and new projects carried out by leading hospitals to support primary medical institutions each year | The person-times professional technical personnel from leading hospitals are stationed to guide primary medical institutions each year | The person-times senior medical experts with advanced professional titles from leading hospitals participate in outpatient clinics, rounds, and consultations (including remote consultations) at primary medical institutions each year |

The number of township health centers that are assisted within the close-knit medical consortium system	1			
The situation of clinical teaching, teaching rounds, health education technical guidance, specialty construction, new technologies, and new projects carried out by leading hospitals to support primary medical institutions each year	——	1		
The person-times professional technical personnel from leading hospitals are stationed to guide primary medical institutions each year	——	——	1	
The person-times senior medical experts with advanced professional titles from leading hospitals participate in outpatient clinics, rounds, and consultations (including remote consultations) at primary medical institutions each year	——	——	——	1

Table c.15: Third-level indicators discrimination

Training and exchange	The number of free training sessions conducted by leading hospitals for primary medical institutions each year	The person-times primary medical institutions send staff to study and further their education at leading hospitals each year	The person-times primary medical institutions go to leading hospitals for more than three months of further education each year	The number of pairs of mentor-mentee relationships established between physicians from leading hospitals and physicians from primary medical institutions	Establish a timely communication mechanism between county-level experts and primary care doctors, general practitioners
The number of free training sessions conducted by leading hospitals for primary	1				

medical institutions each year				
The person-times primary medical institutions send staff to study and further their education at leading hospitals each year	——	1		
The person-times primary medical institutions go to leading hospitals for more than three months of further education each year	——	——	1	
The number of pairs of mentor-mentee relationships established between physicians from leading hospitals and physicians from primary medical institutions	——	——	——	1
Establish a timely communication mechanism between county-level experts and primary care doctors, general practitioners	——	——	——	——	1

Table c.16: Third-level indicators discrimination

Integration of medical and preventive services	Coverage rate of family doctor contract services for key populations within the close-knit medical consortium	The percentage of residents who have established personal health records in the close-knit medical consortium	The number of general practitioners per 10,000 people	The number of general practitioners per 10,000 people

Coverage rate of family doctor contract services for key populations within the close-knit medical consortium	1			
The percentage of residents who have established personal health records in the close-knit medical consortium	——	1		
The number of general practitioners per 10,000 people	——	——	1	
The number of general practitioners per 10,000 people	——	——	——	1

Table c.17: Third-level indicators discrimination

Service model	Implementation of a comprehensive county-wide health check-up service	Screening for high-risk populations	Experts from the leading hospital serve as the main responsible persons in the family doctor team	Establishment of mobile pharmacies for common and chronic diseases within the close-knit medical consortium	Family doctor teams develop differentiated service plans based on the health status of signed patients	Family doctor teams develop personalized service plans for the elderly, children, pregnant women, and people with disabilities.	Monthly home visits by the family doctor team leader to manage high-risk populations	Monthly disease monitoring and medication guidance for chronic disease patients by the family doctor team	Monthly health education and policy promotion for signed patients by the family doctor team	Monthly one-on-one diagnosis and treatment services provided by experts from the leading hospital to chronic disease, rehabilitation, or other special patients
Implementation of a comprehensive county-wide	1									

Service model	Implementation of a comprehensive county-wide health check-up service	Screening for high-risk populations	Experts from the leading hospital serve as the main responsible persons in the family doctor team	Establishment of mobile pharmacies for common and chronic diseases within the close-knit medical consortium	Family doctor teams develop differentiated service plans based on the health status of signed patients	Family doctor teams develop personalized service plans for the elderly, children, pregnant women, and people with disabilities.	Monthly home visits by the family doctor team leader to manage high-risk populations	Monthly disease monitoring and medication guidance for chronic disease patients by the family doctor team	Monthly health education and policy promotion for signed patients by the family doctor team	Monthly one-on-one diagnosis and treatment services provided by experts from the leading hospital to chronic disease, rehabilitation, or other special patients
health check-up service										
Screening for high-risk populations	——	1								
Experts from the leading	——	——	1							

Service model	Implementation of a comprehensive county-wide health check-up service	Screening for high-risk populations	Experts from the leading hospital serve as the main responsible persons in the family doctor team	Establishment of mobile pharmacies for common and chronic diseases within the close-knit medical consortium	Family doctor teams develop differentiated service plans based on the health status of signed patients	Family doctor teams develop personalized service plans for the elderly, children, pregnant women, and people with disabilities.	Monthly home visits by the family doctor team leader to manage high-risk populations	Monthly disease monitoring and medication guidance for chronic disease patients by the family doctor team	Monthly health education and policy promotion for signed patients by the family doctor team	Monthly one-on-one diagnosis and treatment services provided by experts from the leading hospital to chronic disease, rehabilitation, or other special patients
hospital serve as the main responsible persons in the family doctor team										
Establishment of mobile	——	——	——	1						

Service model	Implementation of a comprehensive county-wide health check-up service	Screening for high-risk populations	Experts from the leading hospital serve as the main responsible persons in the family doctor team	Establishment of mobile pharmacies for common and chronic diseases within the close-knit medical consortium	Family doctor teams develop differentiated service plans based on the health status of signed patients	Family doctor teams develop personalized service plans for the elderly, children, pregnant women, and people with disabilities.	Monthly home visits by the family doctor team leader to manage high-risk populations	Monthly disease monitoring and medication guidance for chronic disease patients by the family doctor team	Monthly health education and policy promotion for signed patients by the family doctor team	Monthly one-on-one diagnosis and treatment services provided by experts from the leading hospital to chronic disease, rehabilitation, or other special patients
pharmacies for common and chronic diseases within the close-knit										

Service model	Implementation of a comprehensive county-wide health check-up service	Screening for high-risk populations	Experts from the leading hospital serve as the main responsible persons in the family doctor team	Establishment of mobile pharmacies for common and chronic diseases within the close-knit medical consortium	Family doctor teams develop differentiated service plans based on the health status of signed patients	Family doctor teams develop personalized service plans for the elderly, children, pregnant women, and people with disabilities.	Monthly home visits by the family doctor team leader to manage high-risk populations	Monthly disease monitoring and medication guidance for chronic disease patients by the family doctor team	Monthly health education and policy promotion for signed patients by the family doctor team	Monthly one-on-one diagnosis and treatment services provided by experts from the leading hospital to chronic disease, rehabilitation, or other special patients
medical consortium										
Family doctor teams develop differentiated service plans	——	——	——	——	1					

Service model	Implementation of a comprehensive county-wide health check-up service	Screening for high-risk populations	Experts from the leading hospital serve as the main responsible persons in the family doctor team	Establishment of mobile pharmacies for common and chronic diseases within the close-knit medical consortium	Family doctor teams develop differentiated service plans based on the health status of signed patients	Family doctor teams develop personalized service plans for the elderly, children, pregnant women, and people with disabilities.	Monthly home visits by the family doctor team leader to manage high-risk populations	Monthly disease monitoring and medication guidance for chronic disease patients by the family doctor team	Monthly health education and policy promotion for signed patients by the family doctor team	Monthly one-on-one diagnosis and treatment services provided by experts from the leading hospital to chronic disease, rehabilitation, or other special patients
based on the health status of signed patients										
Family doctor teams develop	——	——	——	——	——	1				

Service model	Implementation of a comprehensive county-wide health check-up service	Screening for high-risk populations	Experts from the leading hospital serve as the main responsible persons in the family doctor team	Establishment of mobile pharmacies for common and chronic diseases within the close-knit medical consortium	Family doctor teams develop differentiated service plans based on the health status of signed patients	Family doctor teams develop personalized service plans for the elderly, children, pregnant women, and people with disabilities.	Monthly home visits by the family doctor team leader to manage high-risk populations	Monthly disease monitoring and medication guidance for chronic disease patients by the family doctor team	Monthly health education and policy promotion for signed patients by the family doctor team	Monthly one-on-one diagnosis and treatment services provided by experts from the leading hospital to chronic disease, rehabilitation, or other special patients
personalized service plans for the elderly, children, pregnant women, and										

Service model	Implementation of a comprehensive county-wide health check-up service	Screening for high-risk populations	Experts from the leading hospital serve as the main responsible persons in the family doctor team	Establishment of mobile pharmacies for common and chronic diseases within the close-knit medical consortium	Family doctor teams develop differentiated service plans based on the health status of signed patients	Family doctor teams develop personalized service plans for the elderly, children, pregnant women, and people with disabilities.	Monthly home visits by the family doctor team leader to manage high-risk populations	Monthly disease monitoring and medication guidance for chronic disease patients by the family doctor team	Monthly health education and policy promotion for signed patients by the family doctor team	Monthly one-on-one diagnosis and treatment services provided by experts from the leading hospital to chronic disease, rehabilitation, or other special patients
people with disabilities.										
Monthly home visits by the family doctor team	——	——	——	——	——	——	1			

Service model	Implementation of a comprehensive county-wide health check-up service	Screening for high-risk populations	Experts from the leading hospital serve as the main responsible persons in the family doctor team	Establishment of mobile pharmacies for common and chronic diseases within the close-knit medical consortium	Family doctor teams develop differentiated service plans based on the health status of signed patients	Family doctor teams develop personalized service plans for the elderly, children, pregnant women, and people with disabilities.	Monthly home visits by the family doctor team leader to manage high-risk populations	Monthly disease monitoring and medication guidance for chronic disease patients by the family doctor team	Monthly health education and policy promotion for signed patients by the family doctor team	Monthly one-on-one diagnosis and treatment services provided by experts from the leading hospital to chronic disease, rehabilitation, or other special patients
leader to manage high-risk populations										
Monthly disease	——	——	——	——	——	——	——	1		

Service model	Implementation of a comprehensive county-wide health check-up service	Screening for high-risk populations	Experts from the leading hospital serve as the main responsible persons in the family doctor team	Establishment of mobile pharmacies for common and chronic diseases within the close-knit medical consortium	Family doctor teams develop differentiated service plans based on the health status of signed patients	Family doctor teams develop personalized service plans for the elderly, children, pregnant women, and people with disabilities.	Monthly home visits by the family doctor team leader to manage high-risk populations	Monthly disease monitoring and medication guidance for chronic disease patients by the family doctor team	Monthly health education and policy promotion for signed patients by the family doctor team	Monthly one-on-one diagnosis and treatment services provided by experts from the leading hospital to chronic disease, rehabilitation, or other special patients
monitoring and medication guidance for chronic disease										

Service model	Implementation of a comprehensive county-wide health check-up service	Screening for high-risk populations	Experts from the leading hospital serve as the main responsible persons in the family doctor team	Establishment of mobile pharmacies for common and chronic diseases within the close-knit medical consortium	Family doctor teams develop differentiated service plans based on the health status of signed patients	Family doctor teams develop personalized service plans for the elderly, children, pregnant women, and people with disabilities.	Monthly home visits by the family doctor team leader to manage high-risk populations	Monthly disease monitoring and medication guidance for chronic disease patients by the family doctor team	Monthly health education and policy promotion for signed patients by the family doctor team	Monthly one-on-one diagnosis and treatment services provided by experts from the leading hospital to chronic disease, rehabilitation, or other special patients
patients by the family doctor team										
Monthly health education and	——	——	——	——	——	——	——	——	1	

Service model	Implementation of a comprehensive county-wide health check-up service	Screening for high-risk populations	Experts from the leading hospital serve as the main responsible persons in the family doctor team	Establishment of mobile pharmacies for common and chronic diseases within the close-knit medical consortium	Family doctor teams develop differentiated service plans based on the health status of signed patients	Family doctor teams develop personalized service plans for the elderly, children, pregnant women, and people with disabilities.	Monthly home visits by the family doctor team leader to manage high-risk populations	Monthly disease monitoring and medication guidance for chronic disease patients by the family doctor team	Monthly health education and policy promotion for signed patients by the family doctor team	Monthly one-on-one diagnosis and treatment services provided by experts from the leading hospital to chronic disease, rehabilitation, or other special patients
policy promotion for signed patients by the family doctor team										

Service model	Implementation of a comprehensive county-wide health check-up service	Screening for high-risk populations	Experts from the leading hospital serve as the main responsible persons in the family doctor team	Establishment of mobile pharmacies for common and chronic diseases within the close-knit medical consortium	Family doctor teams develop differentiated service plans based on the health status of signed patients	Family doctor teams develop personalized service plans for the elderly, children, pregnant women, and people with disabilities.	Monthly home visits by the family doctor team leader to manage high-risk populations	Monthly disease monitoring and medication guidance for chronic disease patients by the family doctor team	Monthly health education and policy promotion for signed patients by the family doctor team	Monthly one-on-one diagnosis and treatment services provided by experts from the leading hospital to chronic disease, rehabilitation, or other special patients
Monthly one-on-one diagnosis and treatment services provided by	——	——	——	——	——	——	——	——	——	1

Service model	Implementation of a comprehensive county-wide health check-up service	Screening for high-risk populations	Experts from the leading hospital serve as the main responsible persons in the family doctor team	Establishment of mobile pharmacies for common and chronic diseases within the close-knit medical consortium	Family doctor teams develop differentiated service plans based on the health status of signed patients	Family doctor teams develop personalized service plans for the elderly, children, pregnant women, and people with disabilities.	Monthly home visits by the family doctor team leader to manage high-risk populations	Monthly disease monitoring and medication guidance for chronic disease patients by the family doctor team	Monthly health education and policy promotion for signed patients by the family doctor team	Monthly one-on-one diagnosis and treatment services provided by experts from the leading hospital to chronic disease, rehabilitation, or other special patients
experts from the leading hospital to chronic disease, rehabilitation,										

Service model	Implementation of a comprehensive county-wide health check-up service	Screening for high-risk populations	Experts from the leading hospital serve as the main responsible persons in the family doctor team	Establishment of mobile pharmacies for common and chronic diseases within the close-knit medical consortium	Family doctor teams develop differentiated service plans based on the health status of signed patients	Family doctor teams develop personalized service plans for the elderly, children, pregnant women, and people with disabilities.	Monthly home visits by the family doctor team leader to manage high-risk populations	Monthly disease monitoring and medication guidance for chronic disease patients by the family doctor team	Monthly health education and policy promotion for signed patients by the family doctor team	Monthly one-on-one diagnosis and treatment services provided by experts from the leading hospital to chronic disease, rehabilitation, or other special patients
or other special patients										

Table c.18: Third-level indicators discrimination

Service motivation	Implementation of a fair and reasonable distribution system for medical insurance surplus funds	Ratio of average income of intermediate professional title staff between the leading hospital and primary medical institutions	Daily average subsidy amount for dispatched experts from the leading hospital (considering performance assessment for dispatched experts)	Subsidies for medical consortium members who visit higher-level medical institutions for exchange and learning, based on the number of visits	Subsidies for family doctor team members for each home follow-up visit
Implementation of a fair and reasonable distribution system for medical insurance surplus funds	1				
Ratio of average income of intermediate professional title staff between the leading hospital and primary medical institutions	——	1			
Daily average subsidy amount for dispatched experts from the leading hospital (considering	——	——	1		

performance assessment for dispatched experts)					
Subsidies for medical consortium members who visit higher-level medical institutions for exchange and learning, based on the number of visits	——	——	——	1	
Subsidies for family doctor team members for each home follow-up visit	——	——	——	——	1

Table c.19: Third-level indicators discrimination

Assessment and supervision	Establishment of a dedicated management department for the close-knit medical consortium, conducting regular assessments of medical services and quality at primary medical institutions	Frequency of regular evaluation for the family doctor team each year	Regularly assess the primary diagnosis rate and referral rate at the grassroots level	Regularly assess the service volume of the family doctor team	Regularly investigate the improvement of the health level of the population who have contracted with family doctors.
Establishment of a dedicated management department for the close-knit medical consortium, conducting regular assessments of medical services and quality at primary medical institutions	1				

Frequency of regular evaluation for the family doctor team each year	——	1		
Regularly assess the primary diagnosis rate and referral rate at the grassroots level	——	——	1	
Regularly assess the service volume of the family doctor team	——	——	——	1
Regularly investigate the improvement of the health level of the population who have contracted with family doctors.	——	——	——	——	1

Table c.20: Third-level indicators discrimination

Feedback mechanism	Smoothness of feedback channels for members of the close-knit medical consortium	Outpatient experiences of medical and health service collaboration within the close-knit medical consortium	Inpatient experiences of medical and health service collaboration within the close-knit medical consortium
Smoothness of feedback channels for members of the close-knit medical consortium	1		
Outpatient experiences of medical and health service collaboration within the close-knit medical consortium	——	1	
Inpatient experiences of medical and health service collaboration within the close-knit medical consortium	——	——	1

Opinions or suggestions: _____

_____

_____

Annex D: Survey Questionnaire (Supplier)

Evaluation survey form for integrated health management services of Jiangsu Province's close-knit medical consortiums

Filling organization: _____

Filler: _____ Contact number: _____ Date: _____

Note: Please select or fill in the appropriate fields as needed. Thank you for your support and cooperation.

No.	Service guarantee	Answer				
		Please put a "√" on the corresponding number that matches the actual situation, with "1" representing the lowest degree and "5" representing the highest degree, or fill in the blank with the answer.				
1	Clear long-term development goals of the close-knit medical consortium: ("1" indicates that the goal is unclear, while "5" indicates that the goal is clear.)	1	2	3	4	5
2	Sense of belonging and identification of internal members of the close-knit medical consortium: (Identification of medical staff in leading hospitals with the medical consortium and the sense of belonging of primary medical staff with the medical consortium. "1" indicates poor sense of belonging and identification of members with the medical consortium, while "5" indicates a strong sense of belonging and identification of members with the medical consortium.)	1	2	3	4	5
3	Implementation plan for the construction of the close-knit medical consortium:	（1）Yes （2）No				
4	Development of policies for total prepayment of medical insurance and retention of surplus:	（1）Yes （2）No				
5	Development of systems for quality management of medical services and bidirectional referral standards and procedures in the close-knit medical consortium:	（1）Yes （2）No				
6	Development of policies allowing physicians to practice freely in any medical institution within the close-knit medical consortium:	（1）Yes （2）No				
7	Development of guidance for the provision of continuous prevention-diagnosis-rehabilitation-	（1）Yes （2）No				

	care services for patients in the close-knit medical consortium:	
8	Implementation of health education, and the implementation of convenient policies such as long-term prescriptions and extended prescriptions for contracted patients with chronic diseases:	（1）Yes（2）No
9	Development of medical insurance preferential policies for patients referred within the close-knit medical consortium:	（1）Yes（2）No
10	Average proportion of government health service investment in the past three years as a percentage of regular fiscal expenditure:	
11	Average proportion of government investment in the close-knit medical consortium as a percentage of the total income of the medical consortium:	
12	Per capita basic public health subsidy funds in the previous year (yuan): (Per capita basic public health subsidy funds refer to the basic public health service project funds allocated by the central and local finance in a certain year divided by the number of permanent residents at the end of the year.)	
13	Average monthly number of remote consultations in the close-knit medical consortium: (Using information technology to directly provide remote medical services to patients. Remote medical service projects include remote pathological diagnosis, remote consultation, remote outpatient service, remote case discussion and others.)	
14	Recognition of inspection and test results between county and township-level medical institutions within the close-knit medical consortium: (Inspection results refer to the images or data obtained by examining the human body through methods such as ultrasound, X-ray, magnetic resonance imaging, electrophysiology, nuclear medicine and others; test results refer to the data obtained by inspecting materials from the human body using biology, microbiology, immunology, chemistry, blood immunology, hematology, biophysics, cytology and others. Inspection and test results do not include diagnostic conclusions issued by physicians.)	（1）Yes（2）No
15	Establishment of a remote medical system between leading hospitals and township health centers within the close-knit medical consortium: (Including but not limited to remote medical systems such as image centers, testing centers, and	（1）Yes （2）No——Jump to question 17

No.		1	2	3	4	5
	electrocardiogram and computerized electroencephalogram centers.)					
16	The effective operation status of the remote medical system between the leading hospital in the close-knit medical consortium and the township health centers: ("1" indicates very poor operation effect, "5" indicates very good operation effect.)	1	2	3	4	5
17	Continuous recording of electronic health records and electronic medical records in the close-knit medical consortium: (Resident electronic health records and electronic medical records can be recorded in different levels of medical institutions, and the contents are continuously updated. "1" indicates poor implementation, while "5" indicates good implementation.)	1	2	3	4	5
18	Degree of sharing of resident health information in the close-knit medical consortium: (Information systems are interconnected, and resident health information can be shared among various levels of medical institutions, basic medical and public health service projects, and management departments and institutions within the region. "1" indicates poor sharing, while "5" indicates good sharing.)	1	2	3	4	5

No.	Service guidance	Answer
		Please put a "√" on the corresponding number that matches the actual situation, with "1" representing the lowest degree and "5" representing the highest degree, or fill in the blank with the answer.
19	The annual situation of the leading hospital helping primary medical institutions to carry out <u>clinical teaching, teaching rounds, health education, technical guidance, specialty construction, new technologies, and new projects</u>: ("1" indicates that only 1 or fewer of the above assistance projects were carried out, indicating a very poor implementation, while "5" indicates that 5 or more assistance projects were carried out, indicating a very good implementation.)	1 2 3 4 5
20	The person-times professional and technical personnel from the leading hospital are stationed to guide grassroots medical institutions each year:	

No.	Service provision	Answer
21	The person-times senior experts with advanced professional titles from the leading hospital participate in outpatient clinics, ward rounds, and consultations (including remote consultations) at primary medical institutions each year:	
22	The person-times the leading hospital provides free training sessions for primary medical institutions each year:	
23	The person-times staff from primary medical institutions are selected to study and further their education at the leading hospital each year:	
24	The person-times staff from primary medical institutions go to the leading hospital for further education and study for more than three months each year:	
25	The number of pairs of physicians from the leading hospital and physicians from primary medical institutions who establish a "teacher-apprentice" guidance relationship:	

No.	Service provision	Answer
		Please put a "√" on the corresponding number that matches the actual situation, with "1" representing the lowest degree and "5" representing the highest degree, or fill in the blank with the answer.
26	The coverage rate of family doctor signing services for key populations within the close-knit medical consortium: (Year-end number of signed family doctors for key populations (including chronic disease populations, pregnant women, children, the elderly, disabled and others) / year-end number of key populations within the close-knit medical consortium × 100%)	
27	The establishment rate of personal health records for residents within the close-knit medical consortium: (Health record establishment rate = number of residents with established health records within the close-knit medical consortium / number of permanent residents in the county × 100%)	
28	The number of general practitioners per 10,000 people: (Number of general practitioners at the end of the year / number of permanent residents at the end of the year × 10,000)	
29	The number of public health doctors per 10,000 people:	

	(Number of personnel in public health institutions at the end of the year / number of permanent residents at the end of the year × 10,000)					
30	Conducting disease screening for high-risk populations (Mainly for diseases such as hypertension, diabetes, cardiovascular and cerebrovascular diseases, respiratory diseases, stroke, cerebral infarction and others. "1" indicates that the number of screened diseases is ≤1 and the disease screening is not fully conducted; "5" indicates that the number of screened diseases is ≥5 and the disease screening is fully conducted.)	1	2	3	4	5
31	Experts from leading hospitals serve as the main responsible person for family doctor teams: (Proportion calculation formula: the number of experts from leading hospitals serving as the main responsible person for family doctor teams / the number of family doctor teams)	(1) Yes, proportion is: _____ (2) No				
32	Setting up "mobile pharmacies" for common and chronic diseases within the close-knit medical consortium: (Through the leading hospital prescribing drugs for common and chronic diseases within the close-knit medical consortium, the drugs are placed in primary medical institutions to facilitate residents to obtain and use them in a timely manner.)	（1）Yes（2）No				
33	Family doctor teams provide continuous prevention, diagnosis, treatment, rehabilitation, and care services based on the health status of signed populations: (The signed populations are divided into healthy populations, high-risk populations, and patients according to their health status, and different targeted service plans are provided for different populations.)	（1）Yes（2）No				
34	Family doctor teams develop personalized service plans for the elderly, children, pregnant women, and disabled.	（1）Yes（2）No				
35	The number of visits made by the head of the family doctor team (expert from the leading hospital) to the key management population during household visits per month: (The key management population includes but is not limited to chronic disease populations, pregnant women, children, and rehabilitation patients.)					
36	The number of times family doctor team members monitor the condition and provide medication guidance to chronic disease populations per month:					

No.		Answer				
37	The number of times family doctor team members provide health education and policy promotion to signed populations per month: (Including the distribution of health education printed materials, health education audiovisual materials, health education consultation activities for the public, health education lectures.)					
38	The number of times experts from leading hospitals provide "one-on-one" diagnosis and treatment services for chronic disease, rehabilitation, or other special patients per month:					
39	Medical insurance surplus funds are distributed to county-level, township-level, and village-level medical institutions:	(1) Yes (2) No. Jump to question 41				
40	The incentive effect of the distribution of medical insurance surplus funds on county-level, township-level, and village-level medical institutions: ("1" indicates that the incentive effect is very poor, "5" indicates that the incentive effect is very good.)	1	2	3	4	5
41	The ratio of the average income of intermediate title workers in the leading hospital to that of township health centers:					
42	Average daily subsidy amount (in yuan) for experts dispatched by leading hospitals (non-resident):					
43	Close-knit medical consortium provides subsidies or full performance bonuses for personnel from primary medical institutions to visit and learn at leading hospitals:	（1）Yes（2）No				
44	Subsidies are provided for family doctor team members who conduct follow-up visits to households on a per-visit basis:	（1）Yes（2）No				

No.	Service evaluation	Answer
		Please put a "√" on the corresponding number that matches the actual situation, with "1" representing the lowest degree and "5" representing the highest degree, or fill in the blank with the answer.
45	Establish a dedicated management department for the close-knit medical consortium, and regularly assess the medical services and quality of basic medical institutions:	（1）Yes（2）No
46	Frequency of regular evaluation for the family doctor team each year	
47	Regularly assess the primary diagnosis rate and referral rate at the grassroots level each year:	（1）Yes（2）No
48	Regularly assess the service volume of the family doctor team each year:	（1）Yes（2）No

49	Regularly investigate the improvement of the health level of the population who have contracted with family doctors each year:	（1）Yes（2）No				
50	The smoothness of feedback channels for close-knit medical consortium members: (Close-knit medical consortium members provide feedback from bottom to top and receive positive responses. "1" indicates poor feedback smoothness, and "5" indicates excellent feedback smoothness.)	1	2	3	4	5
51	Assess the satisfaction of outpatients with receiving continuous prevention-diagnosis-treatment-rehabilitation-nursing services:	（1）Yes（2）No				
52	Assess the satisfaction of inpatients with receiving continuous prevention-diagnosis-treatment-rehabilitation-nursing services:	（1）Yes（2）No				

Annex E: Survey Questionnaire (Customers)

Health index survey for families in the jurisdiction of XX township health center in the XX County People's Hospital Medical Consortium in 2021

Dear Residents,

This survey is aimed at the health status of families and their members. Please place "√" on the options that apply to your own situation.

<u>Confidentiality guarantees for respondents:</u> We will strictly abide by the *Statistical Law of the People's Republic of China* to keep confidential all information you provide. Please feel free to participate.

Name of interviewer: _____ Contact information: _____ Survey date: _____

Table 1: Personal information of family members (for all)

Basic Information

1. Name: _____
2. ID number: _____
3. Contact information (mobile phone): _____
4. Gender: (1) Male (2) Female
5. Age: _____ years old
6. Personal annual income: _____ yuan
7. Education level (highest level of education completed):

    (1) Primary school and below (2) Junior high school (3) Technical secondary school or high school (4) College (5) Bachelor's degree or above
8. What is your current marital status?

    (1) Married and living with spouse

    (2) Married, but temporarily not living with spouse due to work or other reasons.

    (3) Separated (no longer living together as spouses)

    (4) Divorced

    (5) Widowed

    (6) Never married
9. How many living children do you have? _____
10. What is your current employment status?

(1) Unemployed (2) Employed (3) Retired

(Note: Employment is defined as an activity with the purpose of making a living. Even if the activity does not generate any monetary income, as long as the products and services created in the activity have a significant effect on maintaining livelihood, the activity is considered employment. Farming and working as a self-employed person are both considered employment.)

11. What is your current method of paying for medical expenses (type of medical insurance)? (Multiple options can be selected)

(1) None (2) Urban employee medical insurance (3) Urban and rural resident medical insurance

(4) Commercial medical insurance (5) Other: _____

12. What is the type of your place of residence?

(1) Urban (2) Rural

13. What is your main source of income?

(1) Salary (2) Pension or old-age insurance (3) Agricultural work

(4) Government or social subsidies (5) No source of income

(6) Other: _____ (Note: "Government or social subsidies" refer to subsidies given to individuals or families by the government or society, such as unemployment benefits, elderly care subsidies, disability benefits, relief funds, pension, medical assistance, subsidies for poor households, subsidies for low-income households, social donations and others.)

Health status survey

1. Have you been diagnosed with any of the following chronic diseases? (Multiple choice allowed)

   (1) Hypertension (2) Diabetes (3) Coronary heart disease

   (4) Stroke (5) No chronic disease (6) Other_____

2. Have you ever been diagnosed with anxiety, depression or other emotional disorders?

   (1) Yes (2) No

3. Do you have any disabilities?

   (Inability to move indoors, dress/undress yourself, feed yourself, use the restroom, bathe yourself, groom yourself/comb your hair. "Mild" means you cannot do 1-2 items, "Moderate" means you cannot do 3-4 items, "Severe" means you cannot do 5-6 items)

   (1) No (2) Mild (3) Moderate (4) Severe

4. Subjective health status rating:

If 0 is the worst and 100 is the best, please rate your own health status today as _____ points.

Healthy behaviors survey

1. Smoking status: How often do you smoke cigarettes?

   (1) Never (2) Occasionally (3) Most days (4) Every day

2. Drinking status: How often do you drink alcohol?

   (1) Never (2) Less than once a month (3) 1-3 times a month

   (4) 1-2 times a week (5) 3-5 times a week (6) 6-7 times a week

3. How full do you usually like to feel after eating?

   (1) Satisfied with less than 50% full (2) Satisfied with 60-80% full (3) Satisfied with more than 90% full

   (2) '

4. Do you follow a low-salt diet (avoiding pickles and cured meat)?

   (1) Yes (2) No

5. How often have you measured your weight in the past month?

   (1) Never (2) 1-3 times a month (3) 1-2 times a week

   (4) 3-5 times a week (5) 6-7 times a week

6. How many days in the past week have you measured your blood pressure at home?

   (1) 0 days (2) 1-2 days (3) 3-5 days (4) 6-7 days

7. How many days in the past week have you measured your blood sugar at home?

   (1) 0 days (2) 1-2 days (3) 3-5 days (4) 6-7 days

8. On average, how many hours do you sleep per day?

   _____ hours

9. Do you usually take a nap during the day?

   (1) Yes (2) No

10. In the past week, how many days have you spent a long time sitting (reading, watching TV and others)?

    (1) ___ days

    (2) I have not spent a long time sitting (jump to question 11)

    On one of these days, how long did you usually spend sitting?

    _____ hours_____ minutes

11. In the past week, how many days have you engaged in light physical activity or exercise (walking, housework and others)?

    (1) ___ days

(2) I have not engaged in light physical activity (jump to question 12)

On one of these days, how long did you usually spend on light physical activity or exercise?

_____hours_____minutes

12. In the past week, how many days have you engaged in moderate physical activity or exercise (lifting light weights, cycling at a normal pace, practicing tai chi, dancing, fast walking and others)?

(1) ___days

(2) I have not engaged in moderate physical activity (jump to question 13)

On one of these days, how long did you usually spend on moderate physical activity or exercise?

_____hours_____minutes

13. In the past week, how many days have you engaged in vigorous physical activity or exercise (farming, aerobic exercise, fast cycling, and others)?

(1) ___days

(2) I have not engaged in vigorous physical activity (continue to the next section)

On one of these days, how long did you usually spend on vigorous physical activity or exercise?

_____hours_____minutes

Health service utilization survey

Outpatient service

1. Have you experienced any physical discomfort in the past two weeks?

    (1) Yes (2) No (skip to question 7)

2. Have you visited a doctor because of discomfort in the past two weeks?

    (1) Yes (2) No (skip to question 7)

3. Which type of healthcare institution did you visit for the first time in the past two weeks?

(1) Hospital (including general hospitals, traditional Chinese medicine hospitals, integrated Chinese and Western medicine hospitals, ethnic hospitals, various specialty hospitals, nursing homes and others)

(2) Primary healthcare institution (Caiqiao Town Health Center)

(3) Primary healthcare institution (including other township health centers, village clinics, and clinics except for Caiqiao Town Health Center)

4. How many kilometers did you travel from your home to this healthcare institution for the first visit? _____ km

5. Did you have a referral experience for this visit?

(1) Yes, referred from a primary healthcare institution to a higher-level hospital

(2) Yes, referred from a higher-level hospital to a primary healthcare institution

(3) No, visited directly

6. What was the total cost of this visit? _____ yuan

How much money did you spend on your own? _____ yuan

Inpatient service

7. Have you been hospitalized in the past year? If yes, how many times?

(1) Yes, _____ times (2) No → (skip to question 11)

8. Which type of healthcare institution did you stay at for your latest hospitalization?

(1) Hospital (including general hospitals, traditional Chinese medicine hospitals, integrated Chinese and Western medicine hospitals, ethnic hospitals, various specialty hospitals, nursing homes and others)

(2) Primary healthcare institution (Caiqiao Town Health Center)

(3) Primary healthcare institution (including other township health centers, village clinics, and clinics except for Caiqiao Town Health Center)

9. Did you have a referral experience for your latest hospitalization?

(1) Yes, referred from a primary healthcare institution to a higher-level hospital

(2) Yes, referred from a higher-level hospital to a primary healthcare institution

(3) No, visited directly

10. In the past year, what was the total expenditure for hospitalization? _____ yuan

How much money did you spend on your own? _____ yuan

Total medical expenses

11. In the past year, how much did you spend on medical expenses?

(1) Total medical expenses: _____ yuan (2) No medical expenses

12. How much did you spend on self-treatment in the past year?

(1) Self-treatment expenses: _____ yuan (2) No self-treatment.

Health Management

13. Have you received a health check-up in the past year? (1) Yes (2) No

14. Have you signed up for family doctor services? (1) Yes (2) No

15. Do you have a health record? (1) Yes (2) No

16. Have you received any health management related services in the past year?

(1) Yes (2) No (skip to the next section)

17. How many times have you received follow-up from a health service team in the past three months?

(1) Once (2) Twice (3) Three times

(4) Four times or more (5) Never (skip to the next section)

18. What was included in the health service team follow-up in the past three months? (multiple choices)

(1) Measuring blood pressure or blood sugar (2) Inquiring about symptoms related to hypertension or diabetes

(3) Inquiring about other medical conditions (4) Inquiring about medication use

(5) Inquiring about medical treatment (6) Encouraging smoking cessation

(7) Encouraging alcohol cessation

(8) Encouraging moderate exercise (9) Encouraging low-fat diet

(10) Encouraging low-salt diet (11) None (12) Other_____

19. What were the methods of follow-up? (multiple choices)

(1) Home visit (2) Telephone follow-up (3) Outpatient follow-up (4) Other_____

20. Are you satisfied with the health follow-up services provided by the local township health centers?

(1) Very unsatisfied (2) Somewhat unsatisfied (3) Average (4) Somewhat satisfied

(5) Very satisfied

Table 2: Self-efficacy and resource survey scale for chronic disease (for all chronic disease patients)

Self-efficacy of chronic disease (SECD6):

We would like to know how confident you are in performing certain activities. Based on your recent experiences, please mark the corresponding number with "√". Each number represents your level of confidence in dealing with these matters. "1" represents no confidence at all and "10" represents absolute confidence.

(1) No confidence at all——(10) Absolute confidence

1. How confident are you in controlling the fatigue caused by your illness so that it cannot affect what you want to do?

1 2 3 4 5 6 7 8 9 10

2. How confident are you in controlling the physical discomfort caused by your illness so that it cannot affect what you want to do?

1 2 3 4 5 6 7 8 9 10

3. How confident are you in controlling the depression caused by your illness so that it cannot affect what you want to do?

1 2 3 4 5 6 7 8 9 10

4. How confident are you in controlling the symptoms or health problems caused by your illness so that they cannot interfere with what you want to do?

1 2 3 4 5 6 7 8 9 10

5. How confident are you in taking various measures to improve your health in order to reduce the need to see a doctor?

1 2 3 4 5 6 7 8 9 10

6. How confident are you in doing other things, not just taking medicine, to reduce the impact of your illness on your daily life?

1 2 3 4 5 6 7 8 9 10

Chronic illness resources survey (CIRS):

We would like to know about the various resources you have used for disease management. Based on your actual situation in the past six months, please indicate to what extent you have made each choice by marking the corresponding number with a checkmark "√".

Medical staff

1. Has your doctor discussed disease treatment-related matters with you (such as exercise, diet, medication, regular follow-ups and others)?

(1) Never (2) Occasionally (3) Moderately (4) Quite often (5) Very often

2. Has your doctor or nurse carefully listened to your description of your condition?

(1) Never (2) Occasionally (3) Moderately (4) Quite often (5) Very often

3. Has your doctor or nurse explained your laboratory test results to you in a way that you can understand (such as blood pressure, blood sugar, glycated hemoglobin, cholesterol and others)?

(1) Never (2) Occasionally (3) Moderately (4) Quite often (5) Very often

4. Importance of medical staff in disease management.

(1) Never (2) Occasionally (3) Moderately (4) Quite often (5) Very often

Family and friends

5. Have your family or friends exercised with you?

(1) Never (2) Occasionally (3) Moderately (4) Quite often (5) Very often

6. Have your family or friends reminded you to take your medication?

(1) Never (2) Occasionally (3) Moderately (4) Quite often (5) Very often

7. When you are with your family or friends, do they choose or request healthy foods (low-fat, low-sugar)?

(1) Never (2) Occasionally (3) Moderately (4) Quite often (5) Very often

8. Have your family or friends listened carefully to your description of your condition?

(1) Never (2) Occasionally (3) Moderately (4) Quite often (5) Very often

9. Importance of support from family and friends in disease management

    (1) Never (2) Occasionally (3) Moderately (4) Quite often (5) Very often

Neighbors and community

10. Have you walked or exercised outdoors near your home?

    (1) Never (2) Occasionally (3) Moderately (4) Quite often (5) Very often

11. Have you walked or engaged in other activities with your neighbors?

    (1) Never (2) Occasionally (3) Moderately (4) Quite often (5) Very often

12. Importance of neighbors and community in disease management

    (1) Never (2) Occasionally (3) Moderately (4) Quite often (5) Very often

Table 3: Diabetes-related questionnaires (for diabetes patients aged 15 and above)

Self-Care Behavior Scale for Diabetes Patients (SDSCA):

We would like to know how well you have managed your diabetes in the past seven days. Please mark with a check "√" on the appropriate days.

1. How many days in the past 7 days did you follow your diabetes diet?

    0 1 2 3 4 5 6 7

2. On how many days per week, on average, did you follow your diabetes diet in the past month?

    0 1 2 3 4 5 6 7

3. How many days in the past 7 days did you eat 5 or more kinds of fruits and vegetables?

    0 1 2 3 4 5 6 7

4. How many days in the past 7 days did you eat high-fat foods, such as beef, lamb, or full-fat dairy products?

    0 1 2 3 4 5 6 7

5. How many days in the past 7 days did you engage in physical activity for more than 30 minutes (30 minutes refers to the total time of continuous activity, including walking)?

    0 1 2 3 4 5 6 7

6. In addition to household or work activities, on how many days in the past 7 days did you participate in specific exercise programs (such as swimming, walking, jogging, or cycling)

    0 1 2 3 4 5 6 7

7. How many days in the past 7 days did you check your blood sugar level?

    0 1 2 3 4 5 6 7

8. On how many days in the past 7 days did you monitor your blood sugar level as advised by healthcare providers?

0 1 2 3 4 5 6 7

9. How many days in the past 7 days did you check your feet for sores, cuts, swelling, or other foot problems?

0 1 2 3 4 5 6 7

10. How many days in the past 7 days did you check the inside of your shoes (for foreign objects, flatness, and comfort)?

0 1 2 3 4 5 6 7

11. In the past 7 days, how many days did you take your medications or insulin injections correctly as prescribed by your doctor?

0 1 2 3 4 5 6 7

Problem Areas in Diabetes Scale (PAID):

We would like to know the extent to which diabetes is interfering with your daily life. Please mark with a "√" on the appropriate number based on your experience in the past 3 months.

1. Do you have clear specific goals for your diabetes care?

(1) Not a problem (2) Minor problem (3) Moderate problem (4) Somewhat serious problem (5) Serious problem

2. Do you find it difficult to achieve your diabetes treatment plan?

(1) Not a problem (2) Minor problem (3) Moderate problem (4) Somewhat serious problem (5) Serious problem

3. Do you feel scared when you think about having diabetes?

(1) Not a problem (2) Minor problem (3) Moderate problem (4) Somewhat serious problem (5) Serious problem

4. Does diabetes have a negative impact on your social life?

(1) Not a problem (2) Minor problem (3) Moderate problem (4) Somewhat serious problem (5) Serious problem

5. Do you feel deprived of the freedom to enjoy food and meals?

(1) Not a problem (2) Minor problem (3) Moderate problem (4) Somewhat serious problem (5) Serious problem

6. Do you feel depressed when you think about having diabetes?

(1) Not a problem (2) Minor problem (3) Moderate problem (4) Somewhat serious problem (5) Serious problem

7. Have your emotions and feelings changed because of having diabetes?

(1) Not a problem (2) Minor problem (3) Moderate problem (4) Somewhat serious problem
(5) Serious problem

8. Do you feel defeated by diabetes?

(1) Not a problem (2) Minor problem (3) Moderate problem (4) Somewhat serious problem
(5) Serious problem

9. Are you worried about blood sugar reactions?

(1) Not a problem (2) Minor problem (3) Moderate problem (4) Somewhat serious problem
(5) Serious problem

10. Do you feel angry when you think about having diabetes?

(1) Not a problem (2) Minor problem (3) Moderate problem (4) Somewhat serious problem
(5) Serious problem

11. Are you always worried about food and eating?

(1) Not a problem (2) Minor problem (3) Moderate problem (4) Somewhat serious problem
(5) Serious problem

12. Are you worried about the serious complications that may occur in the future?

(1) Not a problem (2) Minor problem (3) Moderate problem (4) Somewhat serious problem
(5) Serious problem

13. Do you feel guilty or anxious when you do not follow your diabetes management?

(1) Not a problem (2) Minor problem (3) Moderate problem (4) Somewhat serious problem
(5) Serious problem

14. Do you find it unacceptable that you have diabetes?

(1) Not a problem (2) Minor problem (3) Moderate problem (4) Somewhat serious problem
(5) Serious problem

15. Are you dissatisfied with your diabetes doctor?

(1) Not a problem (2) Minor problem (3) Moderate problem (4) Somewhat serious problem
(5) Serious problem

16. Do you feel that diabetes is taking too much of your mental and physical energy every day?

(1) Not a problem (2) Minor problem (3) Moderate problem (4) Somewhat serious problem
(5) Serious problem

17. Are you feeling lonely due to diabetes?

(1) Not a problem (2) Minor problem (3) Moderate problem (4) Somewhat serious problem
(5) Serious problem

18. Are you feeling unsupported by friends and family in your efforts to manage diabetes?

(1) Not a problem (2) Minor problem (3) Moderate problem (4) Somewhat serious problem
(5) Serious problem

19. Do you find it hard to deal with complications of diabetes?

(1) Not a problem (2) Minor problem (3) Moderate problem (4) Somewhat serious problem

(5) Serious problem

20. Are you feeling "burned out" from the constant effort needed to manage diabetes?

(1) Not a problem (2) Minor problem (3) Moderate problem (4) Somewhat serious problem

(5) Serious problem

The Adult Diabetes Knowledge (ADKnowl) Scale:

We would like to know your level of knowledge about diabetes, as well as to understand the indicators that reflect the control status of diabetes. Please answer the following questions as honestly and clearly as possible. Based on your own understanding, mark "√" in the true or false area. If you do not understand the question or do not know the correct answer, please mark "√" in the "don't know" area.

1. Regarding diabetes, what do you think about the following statements:

A. Diabetes can be controlled through treatment.

(1) True (2) False (3) Don't know

B. A small amount of glucose in the urine is normal.

(1) True (2) False (3) Don't know

C. Diabetes may heal itself after a period of time.

(1) True (2) False (3) Don't know

D. Emotional stress can affect blood sugar levels.

(1) True (2) False (3) Don't know

E. Blood sugar levels do not affect the risk of diabetes complications.

(1) True (2) False (3) Don't know

2. When taking oral medication to treat diabetes, what do you think about the medication:

(This option is for diabetes patients using oral medication)

A. Helps lower blood sugar levels.

(1) True (2) False (3) Don't know

B. Does not need to be taken every day.

(1) True (2) False (3) Don't know

C. Can be stopped if no glucose is found in the urine.

(1) True (2) False (3) Don't know

D. Can sometimes cause low blood sugar.

(1) True (2) False (3) Don't know

3. If you use oral hypoglycemic drugs to treat diabetes and experience loss of appetite and have not eaten, what activities are right:

(This option is for diabetes patients using oral medication)

A. Test blood sugar.

(1) True (2) False (3) Don't know

B. Continue taking medication.

(1) True (2) False (3) Don't know

C. Stop taking medication if blood sugar levels are too low.

(1) True (2) False (3) Don't know

D. If you are very thirsty and have to drink a lot of water, you need to see a doctor.

(1) True (2) False (3) Don't know

4. If you use insulin therapy and experience loss of appetite and have not eaten, what activities are right:

(This option is for diabetes patients using insulin therapy)

A. Reduce the amount of insulin used.

(1) True (2) False (3) Don't know

B. Frequently monitor blood sugar and ketone levels.

(1) True (2) False (3) Don't know

C. If the urine ketone is positive, increase the amount of additional rapid-acting insulin.

(1) True (2) False (3) Don't know

D. If you are very thirsty and have to drink a lot of water, you need to see a doctor.

(1) True (2) False (3) Don't know

5. Descriptions of hypoglycemia:

A. There is very little glucose in the plasma.

(1) True (2) False (3) Don't know

B. There is a lot of glucose in the plasma.

(1) True (2) False (3) Don't know

C. Increased physical activity can cause hypoglycemia.

(1) True (2) False (3) Don't know

D. Alcohol can cause hypoglycemia.

(1) True (2) False (3) Don't know

E. Too much insulin can cause hypoglycemia.

(1) True (2) False (3) Don't know

6. Which of the following are symptoms of hypoglycemia?

A. Slurred speech

(1) True (2) False (3) Don't know

B. Thirsty

(1) True (2) False (3) Don't know

C. Sweating

(1) True (2) False (3) Don't know

D. Dizziness

(1) True (2) False (3) Don't know

E. Confusion

(1) True (2) False (3) Don't know

F. Polyuria

(1) True (2) False (3) Don't know

7. If you experience hypoglycemia:

   A. Drink a sugary beverage immediately

   (1) True (2) False (3) Don't know

   B. Eat a piece of chocolate or a cookie immediately

   (1) True (2) False (3) Don't know

   C. Rest for 15 minutes after treating hypoglycemia

   (1) True (2) False (3) Don't know

8. The effects of exercise:

   A. Lower blood sugar levels

   (1) True (2) False (3) Don't know

   B. Raise blood sugar levels

   (1) True (2) False (3) Don't know

   C. Increase glucose levels in urine

   (1) True (2) False (3) Don't know

   D. Do not change blood sugar levels

   (1) True (2) False (3) Don't know

9. If you are using insulin therapy, perform the following activities 1 hour before exercise:

   (This option is for diabetes patients using insulin therapy)

   A. Measure blood sugar

   (1) True (2) False (3) Don't know

   B. Reduce insulin dose if the amount of food intake remains the same

   (1) True (2) False (3) Don't know

   C. If the insulin dose remains the same, eat more food than usual

   (1) True (2) False (3) Don't know

D. Reduce food intake and increase insulin dose

(1) True (2) False (3) Don't know

E. If hypoglycemia occurs, eat sugary food quickly

(1) True (2) False (3) Don't know

10. If you are using insulin therapy, perform the following activities:

(This option is for diabetes patients using insulin therapy)

A. If you eat a piece of chocolate between meals, you need to increase your insulin dose.

(1) True (2) False (3) Don't know

B. If you eat a snack 1 hour before a meal, you can wait until the next meal without increasing your insulin dose.

(1) True (2) False (3) Don't know

C. You need to increase your insulin dose for all snacks.

(1) True (2) False (3) Don't know

11. The effect of the following foods on blood sugar:

A. Sweet foods affect blood sugar.

(1) True (2) False (3) Don't know

B. Foods with high starch content (such as potatoes, bread and others) affect blood sugar levels.

(1) True (2) False (3) Don't know

C. Foods with high protein content (such as meat, cheese and others) affect blood sugar levels.

(1) True (2) False (3) Don't know

D. Full-fat foods have a higher impact on blood sugar than low-fat foods.

(1) True (2) False (3) Don't know

E. 75 grams of glucose requires more insulin than 75 grams of glucose in 100 grams of steamed bun.

(1) True (2) False (3) Don't know

F. Fruits like grapefruit have a smaller impact on blood sugar, so you can eat them as much as you want.

(1) True (2) False (3) Don't know

G. Fresh, unsweetened fruit juice can be consumed without limit.

(1) True (2) False (3) Don't know

12. Description of food:

A. Diabetics should avoid eating any sugary foods.

(1) True (2) False (3) Don't know

B. Foods high in protein can be eaten in large quantities.

(1) True (2) False (3) Don't know

C. Fried foods usually contain high amounts of fat.

(1) True (2) False (3) Don't know

D. Cakes and pastries are high in fat.

(1) True (2) False (3) Don't know

E. Snacks such as melon seeds and peanuts can be eaten without limits.

(1) True (2) False (3) Don't know

F. Sugar-free foods (such as sugar-free mooncakes or sugar-free desserts) can be eaten more.

(1) True (2) False (3) Don't know

G. Limiting salt intake can lower blood pressure.

(1) True (2) False (3) Don't know

H. High-fat foods increase the risk of chronic complications of diabetes.

(1) True (2) False (3) Don't know

I. Foods specially designed for diabetic patients can be eaten without regard to weight goals.

(1) False (2) True (3) Don't know

13. Alcoholic beverages usually:

A. Lower blood sugar levels after a few hours.

(1) True (2) False (3) Don't know

B. Initially cause an increase in blood sugar.

(1) True (2) False (3) Don't know

C. Do not contain calories.

(1) False (2) True (3) Don't know

14. If you are treating diabetes with insulin, do the following activities:

(This option is for diabetes patients who are receiving insulin therapy)

A. If you drink too much beer, you need to increase the dose of insulin to control blood sugar.

(1) True (2) False (3) Don't know

B. If you drink a glass of white wine (beer) during a meal, you don't need to adjust the insulin dose.

(1) True (2) False (3) Don't know

C. If you drink 6 or more units of alcohol at night, you need to reduce the dose of insulin to avoid nocturnal hypoglycemia. (Note: 1 unit of alcohol = half a bottle of beer, 1 small glass of white wine)

(1) True (2) False (3) Don't know

15. Long-term control of blood sugar can reduce the risk of damage to which of the following organs:

A. Foot nerves

(1) True (2) False (3) Don't know

B. Kidneys

(1) True (2) False (3) Don't know

C. Eyes

(1) True (2) False (3) Don't know

16. Regular check-ups include:

A. Foot nerves

(1) True (2) False (3) Don't know

B. Blood pressure

(1) True (2) False (3) Don't know

C. Eyes

(1) True (2) False (3) Don't know

D. Cholesterol levels

(1) True (2) False (3) Don't know

E. Only check the aspects where you have problems.

(1) True (2) False (3) Don't know

17. Use an ophthalmoscope (a special instrument for examining the retina) for eye examinations:

A. Even if a diabetes patient has good blood sugar control, this examination is necessary.

(1) True (2) False (3) Don't know

B. This examination is not necessary for diabetes patients who only use diet control.

(1) True (2) False (3) Don't know

C. It is recommended to examine the eyes because early detection and treatment of retinal diseases can prevent blindness.

(1) True (2) False (3) Don't know

18. If a diabetes patient smokes:

A. It increases the risk of severe foot amputation in diabetes.

(1) True (2) False (3) Don't know

B. It increases the risk of heart disease.

(1) True (2) False (3) Don't know

C. It increases the risk of stroke.

(1) True (2) False (3) Don't know

D. It does not increase the risk of disease compared to non-diabetic smokers.

(1) True (2) False (3) Don't know

E. It is a good way to control weight.

(1) True (2) False (3) Don't know

19. After diabetes, the feet need to be checked for warmth, discoloration, infection, calluses, or injuries:

A. You or someone else should perform a routine check every day.

(1) True (2) False (3) Don't know

B. It is necessary to check when wearing new shoes.

(1) True (2) False (3) Don't know

C. You need to check when you feel uncomfortable.

(1) True (2) False (3) Don't know

D. Only check when you have foot lesions.

(1) True (2) False (3) Don't know

20. Regarding foot care:

A. It is best to choose shoes that are one size larger than your actual shoe size.

(1) True (2) False (3) Don't know

B. Soaking your feet is beneficial.

(1) True (2) False (3) Don't know

C. Your feet may be injured but you don't feel it.

(1) True (2) False (3) Don't know

D. The healing time for foot injuries will be longer than for non-diabetic patients.

(1) True (2) False (3) Don't know

E. If the True care method is not taken, the wound is prone to infection.

(1) True (2) False (3) Don't know

21. When trimming toenails, it is recommended that you:

A. Trim into a pointed shape.

(1) True (2) False (3) Don't know

B. Trim into a shape that follows the contour of the toe (with a round shape).

(1) True (2) False (3) Don't know

22. Foot problems such as blisters and calluses will be treated safely by:

A. Professional foot disease doctor.

(1) True (2) False (3) Don't know

B. Pedicurist.

(1) True (2) False (3) Don't know

C. Yourself.

(1) True (2) False (3) Don't know

D. Anyone.

(1) True (2) False (3) Don't know

23. Recommended shoe types for diabetes patients:

A. Shoes with laces

(1) True (2) False (3) Don't know

B. Soft running shoes

(1) True (2) False (3) Don't know

C. High heels

(1) True (2) False (3) Don't know

D. Open-toe shoes

(1) True (2) False (3) Don't know

E. Pointed-toe shoes

(1) True (2) False (3) Don't know

24. For dry skin on the feet of diabetes patients, it is recommended to:

A. Rub the feet

(1) True (2) False (3) Don't know

B. Apply moisturizer to the feet

(1) True (2) False (3) Don't know

C. Ignore it

(1) True (2) False (3) Don't know

D. See a professional foot doctor

(1) True (2) False (3) Don't know

25. About glycosylated hemoglobin:

A. Can detect if you have low blood sugar

(1) True (2) False (3) Don't know

B. Reflects the average blood sugar level over the past 8-12 weeks

(1) True (2) False (3) Don't know

C. Reflects the average blood sugar level over the past 8-12 days

(1) True (2) False (3) Don't know

D. Reflects the average blood sugar level over the past 24 hours

(1) True (2) False (3) Don't know

26. The target value for glycosylated hemoglobin as specified in the diabetes guidelines in China:

A. The highest value is 6.5%

(1) True (2) False (3) Don't know

B. The highest value is 7.0%

(1) True (2) False (3) Don't know

DSQL（Diabetes-Specific Quality of Life）:

Comprehensive evaluation of the health status of diabetic patients (such as their physical, psychological health, social relationships, and adaptation to their environment). Evaluation of the impact of medical measures (such as the effectiveness of health education and medication) on the patient's health status.

Each question in the questionnaire asks about the patient's own personal feelings, please read the questions and mark the appropriate answer with a checkmark "√". Please note that all questions refer only to your feelings in the past two weeks.

Effects of diabetes on physiological functions (12 questions)

1. Overall, how much damage has diabetes caused to your health?

   (1) No damage at all (2) Some damage (3) Moderate damage (4) Significant damage (5) Extreme damage

2. Do you often feel physically uncomfortable, such as skin itching, limb numbness, or pain?

   (1) Not at all (2) Occasionally (3) Sometimes (about half the time) (4) Often (5) Always

3. How much does the physical discomfort interfere with your daily life?

   (1) Not at all (2) Slightly (3) Moderately (4) Very much (5) Extremely

4. Do you feel that it is increasingly difficult for you to see things?

   (1) Not at all (2) Occasionally (3) Sometimes (about half the time) (4) Often (5) Always

5. How much does the decline in vision affect your daily life?

   (1) Not at all (2) Slightly (3) Moderately (4) Very much (5) Extremely

6. Do you feel that it is increasingly difficult for you to hear others speaking?

   (1) Not at all (2) Occasionally (3) Sometimes (about half the time) (4) Often (5) Always

7. How much does the decline in hearing affect your daily life?

   (1) Not at all (2) Slightly (3) Moderately (4) Very much (5) Extremely

8. Do you feel chest pain, tightness, or palpitations?

   (1) Not at all (2) Occasionally (3) Sometimes (about half the time) (4) Often (5) Always

9. Do you feel that your skin and feet are easily infected?

   (1) Not at all (2) Occasionally (3) Sometimes (about half the time) (4) Often (5) Always

10. How much does skin and foot infections affect your daily life?

    (1) Not at all (2) Slightly (3) Moderately (4) Very much (5) Extremely

11. Do you feel that your reaction to external things has decreased?

(1) Not at all (2) Slightly (3) Moderately (4) Significantly (5) Extremely

12. Do you always feel hungry?

    (1) Not at all (2) Occasionally (3) Sometimes (about half the time) (4) Often (5) Always

Psychosocial dimension (8 questions)

13. Does diabetes frequently cause you trouble and inconvenience in your daily life? (1) Not at all (2) Occasionally (3) Yes, about half of the time (4) Frequently (5) Always

14. Do you often think about what diabetes means to you?

    (1) Not at all (2) Occasionally (3) Yes, about half of the time (4) Frequently (5) Always

15. Are you worried that you might suddenly die?

    (1) Not at all worried (2) Occasionally worried (3) Worried, about half of the time (4) Frequently worried (5) Always worried

16. Does dietary control make you feel annoyed?

    (1) Not annoyed at all (2) Occasionally annoyed (3) Annoyed, about half of the time (4) Frequently annoyed (5) Always annoyed

17. Does regular self-monitoring of urine sugar or going to the hospital to check blood sugar bother you?

    (1) Not bothered at all (2) Occasionally bothered (3) Bothered, about half of the time (4) Frequently bothered (5) Always bothered

18. Do you feel nervous or uneasy because of diabetes?

    (1) Not at all (2) Occasionally (3) Yes, about half of the time (4) Frequently (5) Always

19. Are you satisfied with your current treatment results?

    (1) Extremely satisfied (2) Very satisfied (3) Satisfied (moderately) (4) Very dissatisfied (5) Extremely dissatisfied

20. Do you believe you can overcome the troubles caused by the disease?

    (1) Don't believe at all (2) Somewhat believe (3) Believe (moderately) (4) Very believe (5) Extremely believe

Social relationship dimension (4 questions)

21. In general, does diabetes harm your interpersonal relationships?

    (1) No harm at all (2) Slightly harmful (3) Harmful (moderately) (4) Very harmful (5) Extremely harmful

22. Do you feel that people dislike you because you have diabetes?

    (1) Not at all (2) Occasionally (3) Yes, about half of the time (4) Frequently (5) Always

23. Does diabetes affect your status and role at home or in the workplace?

    (1) No impact at all (2) Slightly impact (3) Impact (moderately) (4) Very impact (5) Extremely impact

24. Do you often communicate with other patients about experiences, issues, and knowledge related to diabetes?

(1) Never communicate (2) Occasionally communicate (3) Communicate, about half of the time (4) Communicate frequently (5) Always communicate

Treatment dimension (3 questions)

25. Do you have allergic reactions, nausea, or other adverse drug reactions after taking medication?

(1) Not at all (2) Occasionally (3) Yes, about half of the time (4) Frequently (5) Always

26. Do you experience low blood sugar reactions such as palpitations, dizziness, and sweating?

(1) Not at all (2) Occasionally (3) Yes, about half of the time (4) Frequently (5) Always

27. How much does dietary control restrict your lifestyle or habits?

(1) Not restricted at all (2) Slightly restricted (3) Restricted (moderately) (4) Very restricted (5) Extremely restricted

Table 4: Hypertension-related questionnaire (for hypertensive patients aged 15 and above)

Hypertension Patients Self-Management Behavior Rating Scale, HPSMBRS：

Please read the questions and mark the corresponding option with a "√".

Diet management

1. Control the intake of sodium salt and eat less salty foods (such as salted vegetables, soybean paste, puffed food, ham sausage and others)

(1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

2. Eat less high-fat foods (such as fatty meat, cream, ice cream, fried foods and others)

(1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

3. Eat less foods with high cholesterol (such as animal organs, fish roe, egg yolk, animal skin and others)

(1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

4. Choose moderate amounts of high-quality protein foods (such as milk, fish, lean meat, soybeans and others)

(1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

5. Choose moderate amounts of blood pressure-lowering foods (such as celery, radish, carrots, fungus and others)

(1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

6. Eat less strongly stimulating foods (such as chili, extremely cold or hot foods and others)

(1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

7. Eat more fresh vegetables and fruits

   (1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

8. Pay attention to balanced nutrition

   (1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

9. Control body weight

   (1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

10. Eat more fiber-rich foods to prevent constipation

    (1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

Medication management

11. Take antihypertensive medication according to the doctor's prescription

    (1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

12. Take antihypertensive medication at the prescribed time according to the doctor's prescription

    (1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

13. Take antihypertensive medication according to the doctor's prescription requirements

    (1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

14. Persist in taking antihypertensive medication regularly for a long time

    (1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

Emotional management

15. Make an effort to change my impatient personality

    (1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

16. When my blood pressure rises and I feel dizzy, I take a moment to calm down and rest.

    (1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

17. When I feel emotional, I try to calm down.

    (1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

18. When I get angry, I control my emotions.

    (1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

19. When I worry about something, I persuade myself to relax.

    (1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

20. After being diagnosed with high blood pressure, I make an effort to control my emotions and keep calm as much as possible.

    (1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

21. I try to maintain emotional stability and avoid mood swings.

    (1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

22. I try to slow down and take my time when doing things in my daily life.

(1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

Work and rest management

23. I do some housework (such as buying groceries and cleaning) according to my blood pressure condition.

(1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

24. I use labor-saving tools (such as washing machines) to reduce household chores according to my blood pressure condition.

(1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

25. When I feel tired, I stop and take a break.

(1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

26. I adjust the timing, amount, and content of my work (and household chores) according to my blood pressure condition.

(1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

Illness monitoring

27. If the patient has had hypertension for ≤5 years, they should undergo blood biochemistry, blood sugar, kidney function, fundus, and electrocardiogram examinations once a year. If they have had hypertension for >5 years, they should undergo blood biochemistry, blood sugar, electrocardiogram, echocardiogram, kidney function, fundus, brain CT, lower limb arterial color Doppler ultrasound, and cervical color Doppler ultrasound examinations once a year.

(1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

28. When the systolic blood pressure is between 140-159mmHg or the diastolic blood pressure is between 90-99mmHg, blood pressure should be measured once a day. When the systolic blood pressure is greater than 160mmHg or the diastolic blood pressure is greater than 100mmHg, blood pressure should be measured twice a day.

(1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

29. Consult a doctor when blood pressure fluctuates (high and low).

(1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

30. Regularly undergo follow-up examinations as required by the classification of hypertension.

(1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

Exercise management

31. Engage in appropriate exercise (such as jogging, walking, tai chi, square dancing and others).

(1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

32. Exercise at least 3-5 times a week.

(1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

33. Exercise for 30-60 minutes each time.

    (1) Never (2) Seldom (3) Sometimes (4) Often (5) Always

Quality of Life Instrument for Chronic Patients with Hypertension (QLICD-HY):

Please read the questions and mark the corresponding option with a "√".

Physical function PH (8 questions):

1. Can you take care of yourself in terms of daily activities (such as eating, dressing, washing, using the toilet)?

    (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

2. Do you feel easily fatigued?

    (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

3. Do you have difficulty walking 800 meters or more?

    (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

4. Do you have difficulty climbing stairs?

    (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

5. Do you need medication to maintain daily activities?

    (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

6. Do you have a good appetite?

    (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

7. Are you satisfied with your sleep?

    (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

8. Do you have any pain or discomfort?

    (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

Psychological state PS (11 questions):

9. Does the disease affect your cognitive activities?

    (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

10. Does the disease make you feel mentally distressed?

    (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

11. Do you feel lonely and helpless?

    (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

12. Do you feel pessimistic and disappointed?

    (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

13. Do you worry about your illness?

    (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

14. Do you feel irritable or easily angered?

    (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

15. Do you feel tense and anxious?

(1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

16. Would you interrupt medication due to concern about side effects?

(1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

17. Do you consider yourself a burden to your family?

(1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

18. Do you feel inferior due to the disease?

(1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

19. Do you keep your emotions inside but can't forget about them?

(1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

Social functioning SO (11 questions):

20. Has your illness or treatment affected your ability to work or do household chores?

(1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

21. Are you able to fulfill your family roles, such as being a parent, child, or spouse?

(1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

22. Has your illness reduced your ability to care for or show concern for your family members?

(1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

23. Are your relationships with your family members good?

(1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

24. Are you able to get material and emotional support from your family when you need it?

(1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

25. Has your illness affected your ability to participate in leisure activities you enjoy?

(1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

26. Are you able to maintain a positive and optimistic outlook regarding your illness?

(1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

27. Do you think the medical treatment you have received has been helpful in managing your illness?

(1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

28. Has the economic impact of your illness or treatment affected your life?

(1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

29. Are you able to receive care and support from your friends and relatives?

(1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

30. Has your illness or treatment affected your sexual life?

(1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

Hypertensive specific module HY (17 questions):

31. Do you have a headache?

   (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

32. Do you feel dizzy or lightheaded?

   (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

33. Do you have tinnitus (ringing in the ears)?

   (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

34. Do you feel palpitations (racing or pounding heart)?

   (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

35. Do you have shortness of breath or difficult breathing?

   (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

36. Do you have swelling in your lower extremities or ankles?

   (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

37. Do you experience increased nocturia (waking up at night to urinate)?

   (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

38. Do you have dry mouth?

   (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

39. Do you have a cough that is aggravated by irritants?

   (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

40. Do you have blurred vision?

   (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

41. Do you feel slow or sluggish in your responses or movements?

   (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

42. Can you control and adjust negative emotions?

   (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

43. Do you worry about weight issues?

   (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

44. Do you worry about medication issues?

   (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

45. Do you worry about sexual problems caused by illness?

   (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

46. To what extent do you worry about the disease causing greater damage to your body?

   (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

47. Do you feel adaptable to changes in lifestyle, such as dietary or smoking cessation, caused by illness?

   (1) Not at all (2) A little bit (3) Somewhat (4) Quite a bit (5) Very much

Annex F: Partial Results Table

Table F.1 Evaluation index system of integrated health management of the close-knit medical consortium

First-level indicators	Second-level indicators	Third-level indicators
Service guarantee	Common vision	Develop consistent medium - and long-term development goals within the close-knit medical consortium
		The sense of belonging and identification of members within the close-knit medical consortium
	Policy support	Formulate an implementation plan for the construction of a close-knit medical consortium
		Formulate policies for prepayment of total medical insurance and retention of balances
		Establish a system of medical quality management and two-way referral standards and procedures for the close-knit medical consortium
		Establish a policy for physicians to practice freely in any medical institution within the close-knit medical consortium
		Develop a program to guide the close-knit medical consortium to provide patients with a continued service plan of prevention-treatment-rehabilitation-care
		Implement health education, and convenience policies such as long prescriptions and extended prescriptions for patients with chronic diseases
		Formulate preferential medical insurance policies for patients referred within a close-knit medical consortium
	Financial security	The average proportion of government health service investment in recurrent fiscal expenditure in the past three years
		The average proportion of government input to the total revenue of the medical consortium in the past three years
		Per capita basic public health subsidies
	Information construction	Mutual recognition of examination results of medical institutions at county and township levels in the compact medical consortium
		The telemedicine system of the leading hospital and township health centers in the close-knit medical consortium has been established and effectively operated
		The average number of teleconsultations per month in the close-knit medical consortium
		Implementation of continuous electronic health records and electronic medical records in the close-knit medical consortium
		Health information sharing degree of residents in the close-knit medical consortium
Service guidance	Technical guidance	Every year, leading hospitals help primary medical institutions to carry out clinical teaching, teaching rounds, technical guidance of health education, specialty construction, new technology and new projects
		The number of people stationed by professional and technical personnel of leading hospitals to guide primary medical institutions each year

First-level indicators	Second-level indicators	Third-level indicators
Service provision	Training and exchanges	The number of experts with senior professional titles from leading hospitals participating in outpatient service, ward rounds and consultation (including remote consultation) in primary medical institutions every year
		Number of free training sessions held by leading hospitals for primary medical institutions each year
		Number of people selected by primary medical institutions to study in leading hospitals each year
		Number of people in primary medical institutions who go to leading hospitals for further study for more than 3 months every year
		The number of pairs of doctors in leading hospitals and doctors in primary medical institutions to establish a "mentor-apprentice" guidance relationship
	Integration of medical treatment and prevention	The coverage rate of contracted family doctor services for key groups in the close-knit medical consortium
		The filing rate of personal health records of residents in the close-knit medical consortium
		Number of general practitioners per 10,000 people
		Number of public health doctors per 10,000 people
		Carry out disease screening for high-risk groups
		Leading hospital experts as the main persons in charge of the family doctor team
	Service mode	Set up a "mobile pharmacy" for common and chronic diseases in the close-knit medical consortium
		The family doctor team provides prevention-treatment-rehabilitation-care continuity services according to the health status of the contracted population
		The family doctor team develops personalized service plans for the elderly, children, pregnant women, people with disabilities
		Number of monthly home visits by family doctor team leaders to focus on managing the population
		Number of times of condition monitoring and medication guidance for patients with chronic diseases by the family doctor team per month
		Number of times that the family doctor team conducts health education and policy publicity to the contracted population per month
		Number of "one-to-one" diagnosis and treatment services provided by experts in leading hospitals to patients with chronic disease, rehabilitation or other special conditions per month
	Service incentives	Implement a fair and reasonable distribution system for medical insurance balance funds
		Per capita income ratio of workers with intermediate titles in leading hospitals and primary medical and health institutions
		Average daily subsidy amount of experts sent by leading hospitals
		The close-knit medical consortium provides subsidies for those who go to upper-level medical institutions for exchange and study
		Subsidies to family doctor team members for home visits according to the number of times
Service assessment	Assessment supervision	Establish a special management department for the close-knit medical consortium to regularly evaluate the medical business and medical quality of primary medical institutions
		Frequency of regular annual review of the family doctor team

First-level indicators	Second-level indicators	Third-level indicators
	Feedback mechanism	Regular assessment of the primary treatment rate and referral rate at the primary level every year
		Regular assessment of the service volume of the family doctor team
		Regular investigation of the improvement of the health level of the population contracted by family doctors every year
		Accessibility of feedback channels for members of the close-knit medical consortium
		Outpatient experience in the division of labor and collaboration in health services within the close-knit medical consortium
		Inpatients' experience of the division of labor and collaboration in health services in the close-knit medical consortium

Table F.2 Assignment and definition of variables in the diabetic population

Variables	Assignment	Description of the problem
Dependent variables		
Self-management	Continuous variable	SDSCA
Quality of life	Continuous variable	D-QoL
Independent variables		
Integrated health management	0 No/ 1 Yes	Have you received services related to integrated health management?
Frequency of follow-up	0 ≤2 time(s)/ 1 >2 times	How many times have you been followed up by the integrated health services team in the last three months?
Content of follow-up		
Blood glucose measurement	0 No/ 1 Yes	What contents did you receive in the follow-up by the integrated health services team? (multiple choice) 1 measure blood sugar /2 ask about diabetes-related symptoms /3 ask about other diseases /4 ask about medication /5 ask about visits (treatment) /6 persuade to quit smoking /7 persuade to quit drinking /8 persuade to take moderate exercise /9 persuade to have low-fat diet /10 persuade to have a low-salt diet /11 None
Ask about diabetes-related symptoms	0 No/ 1 Yes	
Ask about other medical conditions	0 No/ 1 Yes	
Ask about medication	0 No/ 1 Yes	
Ask about visits (treatment)	0 No/ 1 Yes	
Persuade to quit smoking	0 No/ 1 Yes	
Persuade to quit drinking	0 No/ 1 Yes	
Persuade to take moderate exercise	0 No/ 1 Yes	
Persuade to have a low-fat diet	0 No/ 1 Yes	
Persuade to have a low-salt diet	0 No/ 1 Yes	
Mode of follow-up		
Home follow-up	0 No/ 1 Yes	What are the ways of follow-up? (multiple choice) 1 in-home follow-up / 2 telephone follow-up /3 outpatient follow-up
Telephone follow-up	0 No/ 1 Yes	
Outpatient follow-up	0 No/ 1 Yes	
Diabetes-related health knowledge	Continuous variable	ADKnowl
Diabetes-related health knowledge	Continuous variable	ADKnowl
Diabetes-related emotional state	Continuous variable	PAID

Variables	Assignment	Description of the problem
Self-efficacy	Continuous variable	SECD6
Social support		
Healthcare workers	Continuous variable	CIRS: Healthcare workers
Families and friends	Continuous variable	CIRS: Families and friends
Neighborhood and society	Continuous variable	CIRS: Neighborhood and society
Age	0 ＜65 years old/ 1 ≥65 years old	What's your age?
Gender	0 Male/ 1 Female	What's your gender?
Education level	1 Primary school and below/2 Junior high school/3 Technical secondary or high school/4 College/5 Bachelor degree and above	What's your education level?
Income level	1, 0-1000/2,1000-2000 /3, 2000-5000/4, ＞5000	What's your income level?
Comorbidity	0 No/ 1 Yes	What chronic diseases have you been diagnosed with? (For chronic diseases other than diabetes, there is comorbidity)
Emotional illness	0 No/ 1 Yes	Have you ever been diagnosed with anxiety, depression and other mood disorders?
Incapacitating conditions	0 No/ 1 Yes	Are you incapacitated? (Moving indoors by yourself, dressing/undressing yourself, eating by yourself, going to the bathroom by yourself, showering by yourself, washing/brushing your hair by yourself)
Subjective health scores	Continuous variable	EQ-VAS

Table F.3 Assignment and definition of variables in the hypertensive population

Variables	Assignment	Description of the problem
	Dependent variable	
Self-management	Continuous variable	HPSMBRS
Quality of life	Continuous variable	QLICD-HY
	Independent variable	
Integrated health management	0 No/ 1 Yes	Have you received services related to integrated health management?
Frequency of follow-up	0 ≤2 time(s)/ 1 ＞2 times	How many times have you been followed up by the integrated health services team in the last three months?
Content of follow-up		

Variables	Assignment	Description of the problem
Blood glucose measurement	0 No/ 1 Yes	What contents did you receive in the follow-up by the integrated health services team? (multiple choice) 1. measure blood sugar /2. ask about diabetes-related symptoms /3. ask about other diseases /4. ask about medication /5. ask about visits (treatment) /6. persuade to quit smoking /7. persuade to quit drinking /8. persuade to take moderate exercise /9. persuade to have low-fat diet /10. persuade to have a low-salt diet /11. None
Ask about diabetes-related symptoms	0 No/ 1 Yes	
Ask about other medical conditions	0 No/ 1 Yes	
Ask about medication	0 No/ 1 Yes	
Ask about visits (treatment)	0 No/ 1 Yes	
Persuade to quit smoking	0 No/ 1 Yes	
Persuade to quit drinking	0 No/ 1 Yes	
Persuade to take moderate exercise	0 No/ 1 Yes	
Persuade to have a low-fat diet	0 No/ 1 Yes	
Persuade to have a low-salt diet	0 No/ 1 Yes	
Mode of follow-up		
Home follow-up	0 No/ 1 Yes	What are the ways of follow-up? (multiple choice)
Telephone follow-up	0 No/ 1 Yes	1 in-home follow-up / 2 telephone follow-up /3 outpatient follow-up
Outpatient follow-up	0 No/ 1 Yes	
Self-efficacy	Continuous variable	SECD6
Social support		
Healthcare workers	Continuous variable	CIRS: Healthcare workers
Families and friends	Continuous variable	CIRS: Families and friends
Neighborhood and society	Continuous variable	CIRS: Neighborhood and society
Age	0 <65 years old/ 1 ≥65 years old	What's your age?
Gender	0 Male/ 1 Female	What's your gender?
Education level	1 Primary school and below/2 Junior high school/3 Technical secondary or high school/4 College/5 Bachelor degree and above	What's your education level?
Income level	1, 0-1000/2,1000-2000 /3, 2000-5000/4, >5000	What's your income level?
Comorbidity	0 No/ 1 Yes	What chronic diseases have you been diagnosed with? (For chronic diseases other than diabetes, there is comorbidity)
Emotional illness	0 No/ 1 Yes	Have you ever been diagnosed with anxiety, depression and other mood disorders?
Incapacitating conditions	0 No/ 1 Yes	Are you incapacitated? (Moving indoors by yourself, dressing/undressing yourself, eating by yourself, going to the bathroom by yourself, showering by yourself, washing/brushing your hair by yourself)
Subjective health scores	Continuous variable	EQ-VAS

Table F.4 Evaluation indicators of the integrated health management in close-knit medical consortium

Primary indicators	Secondary indicators	Tertiary indicators
Service guarantee	Shared vision	Shared medium- and long-term development goals
		Sense of belonging and identification of member institutions
		Implementation plan for the construction of the close-knit medical consortium
	Supportive policies	Policies for differentiated health insurance reimbursement
		Policies for prepaying the health insurance and retaining the surplus
		A system regarding healthcare quality management, and standards and procedures of flexible inter-hospital patient transfer
		Policies for physicians to practice in any medical institution of the medical consortium
		Policies for physicians to provide patients with continuous services of "treatment, rehabilitation, and healthcare"
		Health education, long-term prescriptions and extended prescriptions and other user-friendly policies for patients with chronic diseases
		Preferential health insurance policies for patients transferred in close-knit medical consortium
	Payment guarantee	Average proportion of government healthcare investment to recurrent expenditure in the past three years
		Average proportion of government investment to the total revenue of the medical consortium in the past three years
		Per capita cost of healthcare services
		Per capita subsidy of basic public health
Service guidance	Information-sharing system	Mutual recognition of examination and test results between medical institutions at county and rural levels in the close-knit medical consortium
		The completion and effectiveness of the telemedicine system connecting the leading hospital and township health centers
		Teleconsultations in close-knit medical consortium per month
		Continuous electronic health records and electronic medical records
		Information sharing of residents' health conditions among members of the close-knit medical consortium
	Technical guidance	The number of township health centers supported by the leading hospital
		The number of village clinics supported by the leading hospital
		Clinical teaching, teaching on a ward round, and technical guidance on health education, department construction, new technologies and new projects offered by the leading hospital to primary medical institutions
		The number of professionals dispatched by the leading hospital to work in primary medical institutions
		The service delivery number of senior experts from the leading hospital in terms of outpatient services, ward rounds, and consultations (including remote consultations) each year
	Training programs and exchanges	The number of free training programs offered by the leading hospital for primary medical institutions each year
		The number of people selected by primary medical institutions to study at the leading hospital each year
		The number of people from primary medical institutions to study at the leading hospital for more than 3 months each year

Primary indicators	Secondary indicators	Tertiary indicators
Service delivery	Integration of healthcare and disease prevention	The establishment of the weekly meeting system of in the consortium
		The number of "teacher-apprentice" pairs—mentoring relationship between physicians of the leading hospital and physicians of primary healthcare institutions
		The establishment of timely communication mechanism between county-level experts and primary healthcare physicians and general practitioners
		The percentage of key populations registered with family doctors in the medical consortium
		The percent of the region's residents having health records
		The number of general practitioners per 10,000 people
		The number of public health doctors per 10,000 people
		County-wide medical examination services
		Disease screening for high-risk groups
	Service Model	Specialists of the leading hospital in charge of the family doctor team
		A "mobile pharmacy" for people with common and chronic diseases
		The provision of continuous services involving "prevention, diagnosis and treatment, rehabilitation, and healthcare" by family doctors according to the health status of the contracted population
		Personalized service plans designed by family doctors for the elderly, children, pregnant women, and people with disabilities
		Home visits to key groups by the leaders of family doctors per month
		The health-monitoring services and medication suggestions offered by family doctors to the population with chronic disease per month
		The number of health education and policy promotion activities organized by family doctors to the contracted population per month
		"One-to-one" medical services delivered by specialists from the leading hospital to patients with chronic diseases, in rehabilitation, or with other special conditions
	Service motivators	A fair and reasonable distribution system of medical insurance funds surplus
		The ratio between the average income of medical staff with intermediate titles in the leading hospital and the average income of those in primary medical institutions
		Average daily subsidies for specialists dispatched by the leading hospital
		Subsidies for personnel visiting higher-level medical institutions in the medical consortium for training programs
		Subsidies for household follow-up visits by family doctors based on the number of visits
Service evaluation	Assessment and supervision	The establishment of a special management department in the close-knit medical consortium to provide regular assessment of the medical services offered by primary healthcare institutions
		Regular assessment of the family doctor teams

Primary indicators	Secondary indicators	Tertiary indicators
	Feedback mechanism	Regular assessment of the primary treatment rate and transfer rate of primary healthcare institutions
		Regular assessment of the service volume of family doctor teams
		Regular assessment of the health knowledge awareness rate of the population registered with family doctors
		Regular assessment of the improvement of the health status of the population registered with family doctors
		The effectiveness of feedback channels in the close-knit medical consortium
		The experiences of outpatient patients with regards to the coordination and collaboration among the healthcare providers within the consortium
		The experiences of inpatient patients with regards to the coordination and collaboration among the healthcare providers in the consortium

Table F.5 Results of the expert consultation on secondary indicators (first round)

Primary indicators	Secondary indicators	Importance		Operability		Validity	
		$\overline{X} \pm S$	CV (%)	$\overline{X} \pm S$	CV (%)	$\overline{X} \pm S$	CV (%)
Service guarantee	Shared vision	7.53±1.25	16.55	7.13±1.19	16.65	7.67±1.35	17.54
	Supportive policies	9.33±0.62	6.61	9.07±0.96	10.60	8.53±1.30	15.26
	Investment guarantee	8.93±0.88	9.90	9.13±0.35	3.86	8.73±1.03	11.83
	Information-sharing system	8.73±0.70	8.06	8.67±0.90	10.38	8.60±0.91	10.58
Service guidance	Technical guidance	9.87±0.35	3.57	9.60±0.51	5.28	9.40±0.63	6.72
	Training programs and exchanges	8.87±0.83	9.40	8.33±0.82	9.80	8.80±1.01	11.52
Service delivery	Treatment and disease prevention	8.20±1.01	12.37	8.00±0.93	11.58	8.27±1.16	14.06
	Service model	9.93±0.26	2.60	9.60±0.63	6.58	9.67±1.05	10.83
	Service motivators	8.67±1.18	13.55	8.07±1.10	13.63	8.87±0.74	8.38
Service evaluation	Assessment and supervision	9.40±0.51	5.39	9.13±0.52	5.65	9.00±0.66	7.28
	Feedback mechanism	8.20±0.86	10.51	7.93±1.16	14.67	8.00±0.85	10.56

Table F.6 Indicators of expert consultation results (first round)

Primary indicators	Secondary indicators	Tertiary indicators	Importance		Operability		Validity	
			$\overline{X}\pm S$	CV (%)	$\overline{X}\pm S$	CV (%)	$\overline{X}\pm S$	CV (%)
Service guarantee	Shared vision	Consistent medium- and long-term development goals	9.47±0.52	5.45	8.93±0.70	7.88	9.47±0.52	5.45
		Sense of belonging and identification towards the medical consortium	8.27±1.28	15.48	7.67±1.17	15.32	8.00±1.31	16.36
		Implementation plan for the construction of the close-knit medical consortium	8.47±0.92	10.8	8.40±1.24	14.79	8.27±1.10	13.3
	Supportive policies	Policies about differentiated medical insurance reimbursement	8.20±0.94	11.48	8.13±0.99	12.18	8.13±1.06	13.04
		Policies regarding advance payment and surplus retention of medical insurance funds	9.07±0.70	7.76	8.93±0.70	7.88	9.33±0.72	7.76
		A system for managing the quality of medical services and flexible inter-hospital patient transfer standards and procedures	9.20±0.68	7.35	9.00±0.65	7.28	9.07±0.70	7.76
		Policies allowing physicians to work in any member of the medical consortium	8.80±0.78	8.81	8.20±1.21	14.72	8.67±0.90	10.38
		Measures for providing patients with a continuum of services, including prevention, treatment, rehabilitation, and healthcare services	9.73±0.46	4.71	9.53±0.83	8.75	9.60±0.63	6.58
		Policies to better serve the residents, such as health education, long-term prescriptions and extended prescriptions for patients with chronic diseases	8.53±0.83	9.78	8.40±1.18	14.08	8.13±0.91	11.25
		Preferential medical insurance policies for patients transferred within the medical consortium	8.00±0.76	9.45	8.27±0.96	11.62	7.60±0.63	8.32
	Financial guarantee	The average proportion of health service investment in the overall government expenditure in the past three years	8.87±1.19	13.38	8.53±1.06	12.43	8.80±1.26	14.38
		The average proportion of government investment in the total income of the health community in the past three years	9.33±0.72	7.76	9.00±0.84	9.39	9.00±0.84	9.39
		Per capita cost of health services	7.93±1.22	15.42	8.27±1.22	14.79	7.73±1.28	16.56
		Per capita subsidies for basic public health	7.73±1.28	16.56	8.07±1.39	17.19	7.67±1.45	18.87

Primary indicators	Secondary indicators	Tertiary indicators	Importance		Operability		Validity	
			$\overline{X}\pm S$	CV (%)	$\overline{X}\pm S$	CV (%)	$\overline{X}\pm S$	CV (%)
Service guidance	Information-sharing system	Mutual recognition of examination and test results offered by medical institutions at county and rural levels	8.33±0.82	9.8	8.47±0.74	8.77	8.33±0.82	9.8
		Completion and effective operation of the telemedicine system connecting the leading hospital and township health centers	9.53±0.64	6.72	9.60±0.63	6.58	9.27±0.80	8.62
		Monthly remote consultations in the consortium	8.40±0.63	7.52	8.73±0.70	8.06	8.67±0.49	5.63
		Continuous electronic health records and electronic medical records	8.07±0.80	9.9	7.80±1.08	13.87	7.87±0.91	11.63
		The sharing of residents' health information	8.93±0.70	7.88	9.00±0.84	9.39	9.07±0.70	7.76
		The number of township health centers supported in the close-knit medical consortium	7.53±1.13	14.94	7.73±1.22	15.82	7.67±0.82	10.64
		The number of village clinics supported in the close-knit medical consortium	7.60±1.18	15.57	7.87±1.06	13.47	7.73±0.88	11.44
	Technical guidance	The situation of clinical teaching, teaching on a ward round, and technical guidance on health education, department construction, new technology, and new projects of medical staff from the leading hospital per year	9.60±0.51	5.28	9.47±0.52	5.45	9.33±0.82	8.75
		The number of professionals dispatched by the leading hospital to work in primary medical institutions per year	9.20±0.56	6.1	9.00±0.53	5.94	9.27±0.80	8.62
		The service delivery number of senior experts from the leading hospital in terms of outpatient services, ward rounds, and consultations (including remote consultations) per year	9.13±0.64	7.01	9.20±0.41	4.5	9.27±0.60	6.41
	Training programs and exchanges	The number of free training programs offered by the leading hospital for primary medical institutions per year	8.07±0.88	10.95	8.27±1.03	12.49	8.13±0.99	12.18
		The number of people selected by primary medical institutions study at the leading hospital per year	8.93±0.80	8.95	8.73±0.96	11.01	8.73±0.96	11.01
		The number of people from primary medical	9.13±0.83	9.13	8.93±0.70	7.88	9.13±0.74	8.14

Primary indicators	Secondary indicators	Tertiary indicators	Importance		Operability		Validity	
			$\bar{X} \pm S$	CV (%)	$\bar{X} \pm S$	CV (%)	$\bar{X} \pm S$	CV (%)
Service delivery	Integration of healthcare and disease prevention	institutions study at the leading hospital for more than three months per year						
		The establishment of the weekly meeting system in the consortium	7.67±1.11	14.51	7.40±1.12	15.15	7.67±1.11	14.51
		The number of "teacher-apprentice" pairs—a mentoring relationship between physicians of the leading hospital and physicians of primary healthcare institutions	9.13±0.64	7.01	9.20±0.68	7.35	9.07±0.88	9.75
		A timely communication mechanism between county-level experts primary healthcare physicians and general practitioners	8.47±0.64	7.56	8.33±0.49	5.86	8.20±0.94	11.48
		The percentage of key populations registered with family doctors in the medical consortium	8.07±1.03	12.8	8.00±1.41	17.68	7.73±1.39	17.94
		The percentage of the region's residents having health records	8.07±0.88	10.95	8.20±1.15	13.98	7.6±70.72	9.44
		The number of general practitioners per 10,000 people	9.00±0.54	5.94	8.93±0.70	7.88	8.40±0.99	11.74
		The number of public health doctors per 10,000 people	8.73±0.70	8.06	8.93±0.70	7.88	8.33±0.90	10.8
		County-wide medical examination services	8.20±0.94	11.48	8.27±1.22	14.79	7.87±0.99	12.58
		Disease screening for high-risk groups	9.33±0.49	5.23	9.13±0.74	8.14	9.13±0.83	9.13
		Specialists from the leading hospital administer family doctors	9.13±0.52	5.65	9.13±0.52	5.65	8.87±0.64	7.22
		"Mobile pharmacies" for people with common diseases and chronic diseases	8.27±1.22	14.79	8.53±1.41	16.49	8.47±1.06	12.51
	Service model	The provision of continuous services involving "prevention, diagnosis and treatment, rehabilitation, and healthcare" by family doctors according to the health status of the contracted population	9.33±0.72	7.76	8.93±0.96	10.76	9.00±0.93	10.29
		Personalized service plans designed by family doctors for the elderly, children, pregnant women, and people with disabilities	9.40±0.63	6.72	8.87±0.99	11.16	8.80±1.21	13.72

Primary indicators	Secondary indicators	Tertiary indicators	Importance		Operability		Validity	
			$\bar{X}\pm S$	CV (%)	$\bar{X}\pm S$	CV (%)	$\bar{X}\pm S$	CV (%)
		Home visits to key groups by the leaders of family doctors per month	8.93±0.70	7.88	8.93±0.96	10.76	9.07±0.46	5.05
		The health-monitoring services and medication suggestions offered by family doctors to the population with chronic diseases per month	8.87±0.64	7.22	8.80±0.94	10.69	8.60±1.24	14.44
		The number of health education and policy promotion activities organized by family doctors to the contracted population per month	8.20±0.77	9.45	8.33±0.62	7.41	7.80±1.42	18.26
		"One-to-one" medical services delivered by specialists from the leading hospital to patients with chronic diseases, in rehabilitation, or with other special conditions	8.80±0.86	9.8	8.87±0.83	9.4	8.47±1.36	16.01
		A fair and reasonable system for distributing medical insurance funds surplus	9.20±0.68	7.35	8.80±1.01	11.52	8.93±0.88	9.9
		The ratio between the average income of medical staff with intermediate titles in the leading hospital and the average income of those in primary medical institutions	8.93±0.70	7.88	8.73±0.88	10.13	8.80±0.77	8.81
	Service encouragements	Average daily subsidies for specialists dispatched by the leading hospital (according to their performance)	9.07±0.70	7.76	8.60±0.83	9.63	9.13±0.91	10.02
		Subsidies for personnel visiting higher-level medical institutions in the medical consortium for training programs	8.80±1.08	12.3	8.53±0.99	11.61	8.67±1.17	13.55
		Subsidies for household follow-up visits by family doctors based on the number of visits	8.53±0.91	10.73	8.60±0.74	8.57	8.67±0.98	11.26
Service evaluation	Assessment and supervision	A special department in charge of the close-knit medical consortium management department regularly assesses the medical business and medical quality of primary healthcare institutions	9.20±0.68	7.35	8.87±0.74	8.38	9.27±0.88	9.54
		Regular assessment of the family doctor teams	9.00±0.76	8.4	8.87±0.91	10.32	8.87±1.12	12.68
		Annual assessment of the primary treatment rate and patient transfer rate of primary healthcare institutions	8.13±0.83	10.26	8.27±0.88	10.69	8.00±0.84	10.56

Primary indicators	Secondary indicators	Tertiary indicators	Importance		Operability		Validity	
			$\overline{X}\pm S$	CV (%)	$\overline{X}\pm S$	CV (%)	$\overline{X}\pm S$	CV (%)
	Feedback mechanism	Annual assessment of the service volume of family doctor teams	8.93±0.70	7.88	8.80±0.94	10.69	8.67±1.05	12.08
		Annual assessment of the health knowledge awareness rate of the population registered with family doctors	7.73±0.96	12.43	7.73±1.16	15.05	7.67±1.29	16.83
		Annual assessment of the improvement of the health status of the population registered with family doctors	9.00±0.76	8.4	8.67±1.23	14.23	9.00±1.07	11.88
		The effectiveness of feedback channels	8.73±0.59	6.8	8.73±0.96	11.01	8.67±0.49	5.63
		The experiences of outpatient patients with regards to the coordination and collaboration among the healthcare providers in the close-knit medical consortium	9.00±0.53	5.94	8.67±1.05	12.08	9.07±0.80	8.81
		The experiences of inpatient patients with regard to the coordination and collaboration among the healthcare providers in the close-knit medical consortium	8.93±0.80	8.95	8.67±1.05	12.08	9.20±0.77	8.42

Table F.7 Results of expert consultation on secondary indicators (second round)

Primary indicators	Secondary indicators	Importance		Operability		Validity	
		$\overline{X}\pm S$	CV (%)	$\overline{X}\pm S$	CV (%)	$\overline{X}\pm S$	CV (%)
Service guarantee	Shared Vision	7.33±1.11	15.18	6.20±0.86	13.9	6.80±0.86	12.68
	Supportive policies	9.20±0.56	6.10	9.00±0.76	8.40	8.93±0.26	2.89
	Financial guarantee	9.53±0.64	6.72	8.93±0.59	6.65	8.87±0.35	3.97
	information-sharing system	7.93±1.03	13.03	7.93±1.03	13.03	8.33±0.72	8.69
Service guidance	Technical guidance	8.20±0.68	8.24	9.33±0.49	5.23	9.53±0.64	6.72
	Training programs and exchanges	7.93±0.88	11.15	8.20±0.78	9.45	8.40±0.91	10.83
Service delivery	Integration of healthcare and disease prevention	9.33±0.49	5.23	8.00±0.76	9.45	7.87±0.74	9.44
	Service Model	8.53±0.64	7.50	9.07±0.59	6.55	9.60±0.63	6.58
	Service encouragements	9.47±0.52	5.45	8.13±0.74	9.14	8.20±0.78	9.45
Service evaluation	Assessment and supervision	7.80±0.78	9.94	9.00±0.54	5.94	8.93±0.70	7.88
	Feedback mechanism	9.40±0.51	5.39	7.20±1.08	15.03	7.60±0.51	6.67

Table F.8 Results of expert consultation on tertiary indicators (second round)

Primary Indicators	Secondary indicators	Tertiary indicators	Importance $\bar{X}\pm S$	Importance CV (%)	Operability $\bar{X}\pm S$	Operability CV (%)	Validity $\bar{X}\pm S$	Validity CV (%)
Service guarantee	Shared vision	Sense of belonging and identification of member institutions	9.40±0.51	5.39	9.07±0.56	6.55	9.67±0.49	5.05
		Consistent medium- and long-term development goals	7.80±1.42	18.26	6.20±1.66	26.71	6.73±1.39	20.61
		Implementation plan for the construction of the close-knit medical consortium	8.33±0.98	11.72	8.47±0.92	10.8	8.47±0.52	6.09
	Supportive policies	Policies about differentiated medical insurance reimbursement	7.80±1.01	13	7.07±1.39	19.62	7.47±1.46	19.5
		Policies regarding advance payment and surplus retention of medical insurance funds	8.93±0.70	7.88	9.00±0.76	8.4	9.00±1.07	11.88
		A system for managing the quality of medical services and flexible inter-hospital patient transfer standards and procedures	8.53±0.64	7.5	8.13±0.74	9.14	8.47±0.74	8.77
		Policies allowing physicians to work in any member institution of the medical consortium	8.07±0.80	9.9	7.73±1.03	13.36	7.60±0.51	6.67
		Measures for providing patients with a continuum of services, including prevention, treatment, rehabilitation, and healthcare services	9.67±0.49	5.05	9.27±0.59	6.41	9.47±0.64	6.76
		Policies to better serve the residents, such as health education, long-term prescriptions and extended prescriptions for patients with chronic diseases	7.87±0.83	10.6	7.67±0.72	9.44	7.87±0.83	10.6
		Preferential medical insurance policies for patients transferred within the medical consortium	7.80±0.78	9.94	7.47±1.19	15.89	7.60±1.12	14.75
	Financial guarantee	The average proportion of health service investment in the overall government expenditure in the past three years	8.53±1.19	13.92	8.53±0.74	8.71	8.20±1.27	15.43
		The average proportion of government investment in the total income of the health community in the past three years	9.40±0.51	5.39	8.93±0.80	8.95	9.07±0.26	2.84
		Per capita subsidies for basic public health	7.60±0.63	8.32	6.93±1.03	14.91	7.20±0.78	10.76

Primary Indicators	Secondary indicators	Tertiary indicators	Importance		Operability		Validity	
			$\bar{X}\pm S$	CV (%)	$\bar{X}\pm S$	CV (%)	$\bar{X}\pm S$	CV (%)
Service guidance	Information-sharing system	Mutual recognition of examination and test results offered by medical institutions at county and rural levels	8.40±0.91	10.83	8.40±0.63	7.52	8.20±1.01	12.37
		Completion and effective operation of the telemedicine system connecting the leading hospital and township health centers	9.33±0.49	5.23	9.00±1.00	11.11	9.13±0.83	9.13
		Monthly remote consultations in the consortium	7.67±0.98	12.72	7.87±0.99	12.58	7.93±1.10	13.87
		Continuous electronic health records and electronic medical records	7.60±0.63	8.32	7.53±0.92	12.15	7.93±1.10	13.87
		The sharing of residents' health information	8.93±0.70	7.88	8.73±0.70	8.06	9.47±0.74	7.85
		The number of township health centers supported in the close-knit medical consortium	7.00±1.41	20.2	7.33±0.72	9.88	6.93±1.34	19.26
	Technical guidance	The situation of clinical teaching, teaching on a ward round, and technical guidance on health education, department construction, new technology, and new projects offered by medical staff from the leading hospital per year	9.13±1.25	13.65	9.13±0.72	10.02	9.27±0.80	8.62
		The number of professionals dispatched by the leading hospital to work in primary medical institutions per year	8.80±0.94	10.69	8.53±0.64	7.5	8.87±0.52	5.82
		The service delivery number of senior experts from the leading hospital in terms of outpatient services, ward rounds, and consultations (including remote consultations) per year	8.93±0.59	6.65	8.93±0.59	6.65	8.60±1.06	12.28
	Training programs and exchanges	The number of free training programs offered by the leading hospital for primary medical institutions per year	7.87±0.92	11.63	8.00±0.66	8.19	7.80±0.78	9.94
		The number of people selected by primary medical institutions study at the leading hospital per year	8.73±0.59	6.8	8.67±0.72	8.35	8.73±0.59	6.8
		The number of people from primary medical institutions study at the leading hospital for more than 3 months per year	8.87±0.64	7.22	9.13±0.64	7.01	9.40±0.74	7.84

Primary Indicators	Secondary indicators	Tertiary indicators	Importance		Operability		Validity	
			$\overline{X}\pm S$	CV (%)	$\overline{X}\pm S$	CV (%)	$\overline{X}\pm S$	CV (%)
Service delivery	Integration of healthcare and disease prevention	The number of "teacher-apprentice" pairs – a mentoring relationship between physicians of the leading hospital and physicians of primary healthcare institutions	8.67±0.82	9.41	8.33±0.90	10.8	8.73±0.88	10.13
		A timely communication mechanism between county-level experts and primary healthcare physicians and general practitioners	7.53±1.30	17.29	7.67±1.05	13.65	7.87±0.74	9.44
		The percentage of key populations registered with family doctors in the medical consortium	7.67±1.18	15.32	7.80±0.68	8.67	7.60±1.06	13.89
		The percentage of the region's residents having health records	7.47±1.06	14.19	7.20±0.68	11.97	6.93±1.03	14.91
		The number of general practitioners per 10,000 people	8.07±0.70	8.72	8.33±0.82	9.8	7.73±0.80	10.34
		The number of public health doctors per 10,000 people	8.20±0.78	9.45	8.07±0.80	9.9	7.87±0.52	6.56
		County-wide medical examination services	7.87±0.74	9.44	7.73±0.59	7.68	7.20±0.56	7.79
		Disease screening for high-risk groups	9.13±0.35	3.86	9.07±0.46	5.05	8.93±0.59	6.65
		Specialists from the leading hospital administer family doctors	9.33±0.49	5.23	9.27±0.59	6.41	9.27±0.46	4.94
	Service model	"Mobile pharmacies" for people with common diseases and chronic diseases	7.33±0.72	9.88	7.33±1.11	15.18	7.67±0.72	9.44
		The provision of continuous services involving "prevention, diagnosis and treatment, rehabilitation, and healthcare" by family doctors according to the health status of the contracted population	9.00±0.66	7.28	8.80±0.41	4.7	8.47±0.64	7.56
		Personalized service plans designed by family doctors for the elderly, children, pregnant women, and people with disabilities	9.13±0.64	7.01	8.73±0.59	6.8	8.60±0.64	7.35
		The number of home visits to key groups by the leaders of family doctors per month	8.53±0.74	8.71	8.60±0.63	7.35	8.60±0.63	7.35
		The health-monitoring services and medication suggestions offered by family doctors to the population with chronic diseases per month	8.27±1.03	12.49	8.47±0.83	9.85	8.13±1.06	13.04

Primary Indicators	Secondary indicators	Tertiary indicators	Importance		Operability		Validity	
			$\overline{X}\pm S$	CV (%)	$\overline{X}\pm S$	CV (%)	$\overline{X}\pm S$	CV (%)
Service evaluation	Service encouragements	The number of health education and policy promotion activities organized by family doctors to the contracted population per month	7.53±1.41	18.69	7.27±1.16	16	6.73±0.70	10.46
		"One-to-one" medical services delivered by specialists from the leading hospital to patients with chronic diseases, in rehabilitation, or with other special conditions	8.87±0.52	5.82	8.73±0.59	6.8	8.27±0.70	9.66
		A fair and reasonable system for distributing medical insurance funds surplus	9.07±0.59	6.55	8.60±0.63	7.35	8.60±0.63	7.35
		The ratio between the average income of medical staff with intermediate titles in the leading hospital and the average income of those in primary medical institutions	8.53±0.83	9.78	7.93±1.16	14.67	8.33±0.82	9.8
		Average daily subsidies for specialists dispatched by the leading hospital	8.53±0.83	9.78	8.13±0.74	9.14	8.47±0.92	10.8
		Subsidies for personnel visiting higher-level medical institutions in the medical consortium for training programs	8.40±0.74	8.77	8.00±0.93	11.58	8.40±0.99	11.74
		Subsidies for household follow-up visits by family doctors based on the number of visits	8.40±0.63	7.52	8.00±0.85	10.56	7.93±1.03	13.03
	Assessment and supervision	A special department in charge of the close-knit medical consortium management department to regularly assess the medical business and medical quality of primary healthcare institutions	9.13±0.64	7.01	8.80±0.56	6.38	9.53±0.52	5.41
		Annual assessments of family doctors	8.93±0.80	8.95	8.93±1.03	11.57	8.67±0.72	8.35
		Annual assessment of the primary treatment rate and patient transfer rate of primary healthcare institutions	7.60±0.91	11.97	7.33±1.05	14.28	7.40±1.12	15.15
		Annual assessment of the service volume of family doctor teams	8.73±0.70	8.06	8.47±0.64	7.56	8.47±0.52	6.09
		Annual assessment of the improvement of the health status of the population registered with family doctors	9.67±0.49	5.05	8.60±0.74	8.57	8.87±0.92	10.32

Primary Indicators	Secondary indicators	Tertiary indicators	Importance		Operability		Validity	
			$\overline{X}\pm S$	CV (%)	$\overline{X}\pm S$	CV (%)	$\overline{X}\pm S$	CV (%)
	Feedback mechanism	The effectiveness of feedback channels	7.87±0.83	10.6	7.93±0.80	10.08	8.20±0.94	11.48
		The experiences of outpatient patients with regards to the coordination and collaboration among the healthcare providers in the close-knit medical consortium	8.80±0.68	7.68	8.73±0.88	10.13	8.87±0.52	5.82
		The experiences of inpatient patients with regards to the coordination and collaboration among the healthcare providers in close-knit medical consortium	8.80±0.68	7.68	8.80±0.56	6.38	9.33±0.62	6.61

Table F.9 Evaluation index system of integrated health management in close-knit medical consortium

Primary indicators	Secondary indicators	Tertiary indicators
Service guarantee	Shared vision	Consistent medium- and long-term development goals
		Sense of belonging and identification of member institutions
		Implementation plan for the construction of the close-knit medical consortium
	Supportive policies	Policies regarding advance payment and surplus retention of medical insurance funds
		A system for managing the quality of medical services and flexible inter-hospital patient transfer standards and procedures
		Policies allowing physicians to work in any member institution of the medical consortium
		The provision of continuous services involving disease prevention, diagnosis and treatment, rehabilitation, and healthcare
		Policies to better serve the residents, such as health education, long-term prescriptions and extended prescriptions for patients with chronic diseases
		Preferential health insurance policies for patients transferred in close-knit medical consortium
	Financial guarantee	The average proportion of health service investment in the overall government expenditure in the past three years
		The average proportion of government investment in the total income of the health community in the past three years
		Per capita subsidies for basic public health
Service guidance	Information-sharing system	Mutual recognition of examination and test results offered by medical institutions at county and rural levels
		Completion and effective operation of the telemedicine system connecting the leading hospital and township health centers
		Monthly remote consultations in the consortium
		Continuous electronic health records and electronic medical records
		The sharing of residents' health information
	Technical guidance	The situation of clinical teaching, teaching on a ward round, and technical guidance on health education, department construction, new technology, and new projects offered by medical staff from the leading hospital per year
		The number of professionals dispatched by the leading hospital to work in primary medical institutions per year
		The service delivery number of senior experts from the leading hospital in terms of outpatient services, ward rounds, and consultations (including remote consultations) per year
	Training programs and exchanges	The number of free training programs offered by the leading hospital for primary medical institutions per year
		The number of people selected by primary medical institutions study at the leading hospital per year
		The number of people from primary medical institutions study at the leading hospital for more than 3 months per year
		The number of "teacher-apprentice" pairs – a mentoring relationship between physicians of the leading hospital and physicians of primary healthcare institutions
Service delivery	Integration of healthcare and disease	The percentage of key populations registered with family doctors in the medical consortium
		The percentage of the region's residents having health records

Primary indicators	Secondary indicators	Tertiary indicators
Service evaluation	prevention	The number of general practitioners per 10,000 people The number of public health doctors per 10,000 people Disease screening for high-risk groups
	Service model	Specialists from the leading hospital administer family doctors "Mobile pharmacies" for people with common diseases and chronic diseases The provision of continuous services involving "prevention, diagnosis and treatment, rehabilitation, and healthcare" by family doctors according to the health status of the contracted population Personalized service plans designed by family doctors for the elderly, children, pregnant women, and people with disabilities The number of home visits to key groups by the leaders of family doctors per month The health-monitoring services and medication suggestions offered by family doctors to the population with chronic diseases per month The number of health education and policy promotion activities organized by family doctors to the contracted population per month "One-to-one" medical services delivered by specialists from the leading hospital to patients with chronic diseases, in rehabilitation, or with other special conditions
	Service encouragements	A fair and reasonable system for distributing medical insurance funds surplus The ratio between the average income of medical staff with intermediate titles in the leading hospital and the average income of those in primary medical institutions Average daily subsidies for specialists dispatched by the leading hospital Subsidies for personnel visiting higher-level medical institutions in the medical consortium for training programs Subsidies for household follow-up visits by family doctors based on the number of visits A special department in charge of the close-knit medical consortium management department to regularly assess the medical business and medical quality of primary healthcare institutions
	Assessment and supervision	Annual assessments of family doctors Annual assessment of the primary treatment rate and patient transfer rate of primary healthcare institutions Annual assessment of the service volume of family doctor teams Annual assessment of the improvement of the health status of the population registered with family doctors
	Feedback mechanism	The effectiveness of feedback channels The experiences of outpatient patients with regards to the coordination and collaboration among the healthcare providers in the close-knit medical consortium The experiences of inpatient patients with regards to the coordination and collaboration among the healthcare providers in close-knit medical consortium

Table F.10 Weights of the evaluation indicator system for the integrated health management in close-knit medical consortium

Primary Indicators	Weights	Secondary indicators	Weights	Tertiary indicators	Weights	Portfolio Weight
Service guarantee	0.1331	Shared vision	0.0819	Consistent medium- and long-term development goals	0.5688	0.0062
				Sense of belonging and identification of member institutions	0.4220	0.0046
		Supportive policies	0.4170	Implementation plan for the construction of the close-knit medical consortium	0.2126	0.0118
				Policies regarding advance payment and surplus retention of medical insurance funds	0.2126	0.0118
				A system for managing the quality of medical services and flexible inter-hospital patient transfer standards and procedures	0.1081	0.0060
				Policies allowing physicians to work in any member institution of the medical consortium	0.0739	0.0041
				The provision of continuous services involving disease prevention, diagnosis and treatment, rehabilitation, and healthcare	0.2703	0.0150
				Policies to better serve the residents, such as health education, long-term prescriptions and extended prescriptions for patients with chronic diseases	0.0649	0.0036
				Preferential health insurance policies for patients transferred in close-knit medical consortium	0.0594	0.0033

Primary Indicators	Weights	Secondary indicators	Weights	Tertiary indicators	Weights	Portfolio Weight
		Financial guarantee	0.3704	The average proportion of health service investment in the overall government expenditure in the past three years	0.3509	0.0173
				The average proportion of government investment in the total income of the health community in the past three years	0.4300	0.0212
				Per capita subsidies for basic public health	0.2191	0.0108
		Information-sharing system	0.1307	Mutual recognition of examination and test results offered by medical institutions at county and rural levels	0.1609	0.0028
				Completion and effective operation of the telemedicine system connecting the leading hospital and township health centers	0.2989	0.0052
				Monthly remote consultations in the consortium	0.1149	0.0020
				Continuous electronic health records and electronic medical records	0.1322	0.0023
				The sharing of residents' health information	0.2931	0.0051
Service guidance	0.3014	Technical guidance	0.7734	The situation of clinical teaching, teaching on a ward round, and technical guidance on health education, department construction, new technology, and new projects offered by medical staff from the leading hospital per year	0.5324	0.1241

Primary Indicators	Weights	Secondary indicators	Weights	Tertiary indicators	Weights	Portfolio Weight
				The number of professionals dispatched by the leading hospital to work in primary medical institutions per year	0.1720	0.0401
				The service delivery number of senior experts from the leading hospital in terms of outpatient services, ward rounds, and consultations (including remote consultations) per year	0.2956	0.0689
				The number of free training programs offered by the leading hospital for primary medical institutions per year	0.1362	0.0093
				The number of people selected by primary medical institutions study at the leading hospital per year	0.1684	0.0115
		Training programs and exchanges	0.2266	The number of people from primary medical institutions study at the leading hospital for more than 3 months per year	0.3690	0.0252
				The number of "teacher-apprentice" pairs – a mentoring relationship between physicians of the leading hospital and physicians of primary healthcare institutions	0.3280	0.0224
Service delivery	0.4006	Integration of healthcare and disease prevention	0.2057	The percentage of key populations registered with family doctors in the medical consortium	0.2706	0.0223
				The percentage of the region's residents having health records	0.2184	0.0180

Primary Indicators	Weights	Secondary indicators	Weights	Tertiary indicators	Weights	Portfolio Weight
				The number of general practitioners per 10,000 people	0.3010	0.0248
				The number of public health doctors per 10,000 people	0.2100	0.0173
				Disease screening for high-risk groups	0.1750	0.0422
				Specialists from the leading hospital administer family doctors	0.2177	0.0525
				"Mobile pharmacies" for people with common diseases and chronic diseases	0.0369	0.0089
				The provision of continuous services involving "prevention, diagnosis and treatment, rehabilitation, and healthcare" by family doctors according to the health status of the contracted population	0.1414	0.0341
		Service model	0.6021	Personalized service plans designed by family doctors for the elderly, children, pregnant women, and people with disabilities	0.1082	0.0261
				The number of home visits to key groups by the leaders of family doctors per month	0.0966	0.0233
				The health-monitoring services and medication suggestions offered by family doctors to the population with chronic diseases per month	0.0659	0.0159
				The number of health education and policy promotion activities organized by family doctors to the contracted population per month	0.0431	0.0104

Primary Indicators	Weights	Secondary indicators	Weights	Tertiary indicators	Weights	Portfolio Weight
				"One-to-one" medical services delivered by specialists from the leading hospital to patients with chronic diseases, in rehabilitation, or with other special conditions	0.1153	0.0278
				A fair and reasonable system for distributing medical insurance funds surplus	0.3740	0.0288
				The ratio between the average income of medical staff with intermediate titles in the leading hospital and the average income of those in primary medical institutions	0.1922	0.0148
		Service incentives	0.1922	Average daily subsidies for specialists dispatched by the leading hospital	0.1792	0.0138
				Subsidies for personnel visiting higher-level medical institutions in the medical consortium for training programs	0.1377	0.0106
				Subsidies for household follow-up visits by family doctors based on the number of visits	0.1169	0.0090
Service evaluation	0.1649	Assessment and supervision	0.7714	A special department in charge of the close-knit medical consortium management department to regularly assess the medical business and medical quality of primary healthcare institutions	0.3561	0.0453
				Annual assessments of family doctors	0.1981	0.0252

Primary Indicators	Weights	Secondary indicators	Weights	Tertiary indicators	Weights	Portfolio Weight
				Annual assessment of the primary treatment rate and patient transfer rate of primary healthcare institutions	0.0802	0.0102
				Annual assessment of the service volume of family doctor teams	0.1108	0.0141
				Annual assessment of the improvement of the health status of the population registered with family doctors	0.2555	0.0325
				The effectiveness of feedback channels	0.1729	0.0065
		Feedback mechanism	0.2280	The experiences of outpatient patients with regards to the coordination and collaboration among the healthcare providers in the close-knit medical consortium	0.3484	0.0131
				The experiences of inpatient patients with regards to the coordination and collaboration among the healthcare providers in close-knit medical consortium	0.4787	0.0180

Table F.11 Values and ranking of 50 indicators

Indicators	Southern Jiangsu						Central Suzhou						Northern Jiangsu						Weights
	H1		H2		H3		H4		H5		H6		H7		H8		
	Value	Ranking	Value	Ranking	Value	Ranking	Value	Ranking	Value	Ranking	Value	Ranking	Value	Ranking	Value	Ranking	
C1	4	3.5	5	7	4	3.5	4	3.5	5	7	3	1	5	7	4	3.5	0.0062
C2	4	5.5	4	5.5	4	5.5	4	5.5	3	1.5	4	5.5	4	5.5	3	1.5	0.0046
C3	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	0.0118
C4	1	6.5	0	2.5	1	6.5	1	6.5	0	2.5	0	2.5	1	6.5	0	2.5	0.0118
C5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	0.006
C6	0	3	1	7	0	3	0	3	1	7	0	3	1	7	0	3	0.0041
C7	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	0.015
C8	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	0.0036
C9	0	3	0	3	0	3	1	7	1	7	1	7	0	3	0	3	0.0033
C10	31	7	17	1	26	4	27	6	19	2	26	4	39.2	8	26	4	0.0173
C11	20	4.5	13	1	22	6	20	4.5	15	2	17	3	29.4	8	23	7	0.0212
C12	90	7	87	4	93	8	87	4	87	4	87	4	87	4	85	1	0.0108
C13	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	0.0028
C14	3	4	5	8	4	6	0	2	4	6	0	2	4	6	0	2	0.0052
C15	4	3.5	8	7.5	6	6	3	3	8	7.5	0	1	5	4	4	3.5	0.002
C16	4	4	4	4	4	4	3	1	5	7.5	4	4	5	7.5	4	4	0.0023
C17	3	2.5	4	5.5	5	7.5	3	2.5	4	5.5	3	2.5	5	7.5	3	2.5	0.0051
C18	4	4.5	5	7.5	4	4.5	4	4.5	3	1.5	4	4.5	5	7.5	3	1.5	0.1241
C19	700	4	900	6	1100	7	818	5	650	3	400	1	1896	8	560	2	0.0401
C20	200	5	200	5	320	8	190	2.5	190	2.5	200	5	312	7	180	1	0.0689
C21	40	5.5	30	2	40	5.5	45	7	30	2	38	4	50	8	30	2	0.0093
C22	22	7	20	5	21	6	14	1	15	2	16	3.5	25	8	16	3.5	0.0115
C23	10	5.5	8	2.5	13	8	7	1	9	4	10	5.5	12	7	8	2.5	0.0252
C24	4	6	0	2	5	7	2	4	0	2	3	5	7	8	0	2	0.0224
C25	81	8	73	3	80	7	78	5.5	75	4	69	1	78	5.5	70	2	0.0223
C26	100	4.5	100	4.5	100	4.5	100	4.5	100	4.5	100	4.5	100	4.5	100	4.5	0.018
C27	4.2	4	4.5	6	4.7	8	4.4	5	3.9	1	4.1	2.5	4.6	7	4.1	2.5	0.0248
C28	3.7	7	3.6	6	3.8	8	2.9	1	3.4	3.5	3.4	3.5	3.07	2	3.5	5	0.0173
C29	4	3.5	5	7	5	7	3	1	4	3.5	4	3.5	5	7	4	3.5	0.0422

Indicators	Southern Jiangsu						Central Suzhou				Northern Jiangsu						Weights
	H1		H2		H3		H4		H5		H6		H7		H8		
	Value	Ranking	Value	Ranking	Value	Ranking	Value	Ranking	Value	Ranking	Value	Ranking	Value	Ranking	Value	Ranking	
C30	10	4.5	15	6	25	8	10	4.5	0	2	0	2	20	7	0	2	0.0525
C31	0	2.5	0	2.5	1	6.5	0	2.5	1	6.5	0	2.5	1	6.5	1	6.5	0.0089
C32	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	0.0341
C33	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	0.0261
C34	1	5	0.5	2	1	5	0.5	2	2	7.5	2	7.5	1	5	0.5	2	0.0233
C35	1	4.5	1	4.5	1	4.5	0.5	1	2	8	1	4.5	1	4.5	1	4.5	0.0159
C36	0.5	2	0.5	2	1	6	0.5	2	1	6	1	6	1	6	1	6	0.0104
C37	56	1	160	6	240	7	140	5	120	4	100	3	280	8	60	2	0.0278
C38	3	5.5	0	2.5	4	7	3	5.5	0	2.5	0	2.5	5	8	0	2.5	0.0288
C39	1.5	3.5	1.3	6.5	1.6	1	1.2	8	1.3	6.5	1.5	3.5	1.57	2	1.4	5	0.0148
C40	220	4	240	5.5	300	7.5	300	7.5	240	5.5	200	2.5	200	2.5	160	1	0.0138
C41	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	0.0106
C42	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	0.009
C43	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	0.0453
C44	8	5	4	1	12	7.5	10	6	6	3	6	3	12	7.5	6	3	0.0252
C45	1	5	1	5	1	5	1	5	0	1	1	5	1	5	1	5	0.0102
C46	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	0.0141
C47	0	4	0	4	0	4	0	4	0	4	0	4	1	8	0	4	0.0325
C48	4	5.5	3	2	4	5.5	4	5.5	3	2	3	2	5	8	4	5.5	0.0065
C49	1	5	1	5	1	5	1	5	1	5	1	5	1	5	0	1	0.0131
C50	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	1	4.5	0.018

Table F.12 WRSR values and ranking of integrated health management in close-knit medical consortiums

	Institution	WRSR	Ranking
	H1	0.5793	4
Southern Jiangsu	H2	0.5939	3
	H3	0.7319	2
Central Jiangsu	H4	0.5142	5
	H5	0.4334	7
	H6	0.4792	6
Northern Jiangsu	H7	0.7837	1
	H8	0.3841	8

Table F.13 Distribution of WRSR values of the integrated health management in close-knit medical consortium

Institution	WRSR	f	Σf	R	$\bar{R}$	P	Probit
H8	0.3841	1	1	1	1	12.50	3.8497
H5	0.4334	1	2	2	2	25.00	4.3255
H6	0.4792	1	3	3	3	37.50	4.6814
H4	0.5142	1	4	4	4	50.00	5.0000
H1	0.5793	1	5	5	5	62.50	5.3186
H2	0.5939	1	6	6	6	75.00	5.6745
H3	0.7319	1	7	7	7	87.50	6.1503
H7	0.7837	1	8	8	8	96.87*	6.8620

*Note: Corrected by (1-1/4n) × 100%.

Table F.14 Estimates of WRSR of the integrated health management in close-knit medical consortium

Institution	WRSR	f	Σf	R	$\bar{R}$	P	Probit
H8	0.3841	1	1	1	1	12.50	3.8497
H5	0.4334	1	2	2	2	25.00	4.3255
H6	0.4792	1	3	3	3	37.50	4.6814
H4	0.5142	1	4	4	4	50.00	5.0000
H1	0.5793	1	5	5	5	62.50	5.3186
H2	0.5939	1	6	6	6	75.00	5.6745
H3	0.7319	1	7	7	7	87.50	6.1503
H7	0.7837	1	8	8	8	96.87*	6.8620

Table F.15 Basic information of people with diabetes

Variables	Both groups N=2023	Experimental group N=955	Control group N=1068
Age N (%)			
<65 years old	679(33.56)	339(35.50)	340(31.84)
≥65 years old	1344(66.44)	616(64.50)	728(68.16)
Gender N (%)			
Male	741(36.63)	340(35.60)	401(37.55)
Female	1282(63.37)	615(64.40)	667(62.45)
Education N (%)			
Elementary school and below	1511(74.69)	733(76.75)	778(72.85)
Junior High School	351(17.35)	150(15.71)	201(18.82)
Technical secondary school or high school	147(7.27)	65(6.81)	82(7.68)
Technical college	10(0.49)	4(0.42)	6(0.56)
Bachelor's degree and above	4(0.20)	3(0.31)	1(0.09)

Variables	Both groups N=2023	Experimental group N=955	Control group N=1068
Income N (%)			
≤1000RMB	229(11.32)	134(14.03)	95(8.90)
1000-2000	857(42.36)	356(37.28)	501(46.91)
2000-5000	503(24.86)	249(26.07)	254(23.78)
＞5000	434(21.45)	216(22.62)	218(20.41)
Co-morbidity N (%)			
No	705(34.85)	311(32.57)	394(36.89)
Yes	1318(65.15)	644(67.43)	674(63.11)
Emotional disorders N (%)			
No	1972(97.48)	927(97.07)	1045(97.85)
Yes	51(2.52)	28(2.93)	23(2.15)
Disability N (%)			
No	1857(91.79)	882(92.36)	975(91.29)
Yes	166(8.21)	73(7.64)	93(8.71)
Subjective health scores (mean ± standard deviation)	72.94±11.55	73.39±12.14	72.54±10.98
Diabetes health knowledge ADkonwl (mean ± standard deviation)	52.20±16.38	50.70±16.44	53.54±16.23
Diabetes-related emotional state PAID (Mean ± standard deviation)	11.82±7.55	10.60±8.34	12.91±6.58
Self-efficacy SECD6 (mean ± standard deviation)			
Mean self-efficacy score	6.36±1.28	6.67±1.35	6.09±1.14
Confidence in symptom control	6.36±1.28	6.70±1.36	6.06±1.13
Confidence in treatment	6.37±1.37	6.60±1.46	6.17±1.25
Social support CIRS (mean ± standard deviation)			
Chronic disease resource utilization parity score	3.71±0.49	3.74±0.53	3.70±0.45
Medical and nursing staff	4.23±0.55	4.23±0.50	4.23±0.59
Family and Friends	3.76±0.65	3.73±0.71	3.79±0.59
Neighborhoods and communities	2.92±0.92	3.09±0.94	2.78±0.88

Table F.16 Basic information of groups with hypertension

Variables	Both groups N= 2252	Experimental group N=1,147	Control group N=1,105
Age N (%)			
<65 years old	586(26.02)	310(27.03)	276(24.98)
≥65 years old	1666(73.98)	837(72.97)	829(75.02)
Gender N (%)			
Male	950(42.19)	513(44.73)	437(39.55)
Female	1302(57.81)	634(55.27)	668(60.45)
Education N (%)			
Elementary school and below	1673(74.29)	824(71.84)	849(76.83)
Junior High School	403(17.89)	220(19.18)	183(16.56)
Technical secondary school or high school	165(7.33)	98(8.54)	67(6.07)
Technical college	8(0.36)	3(0.26)	5(0.45)
Bachelor's degree and above	3(0.13)	2(0.18)	1(0.09)
Income N (%)			
<1000RMB	197(8.75)	141(12.29)	56(5.07)
1000-2000	1026(45.56)	460(40.11)	566(51.22)
2000-5000	557(24.73)	288(25.11)	269(24.34)

Variables	Both groups N= 2252	Experimental group N=1,147	Control group N=1,105
＞5000	472(20.96)	258(22.49)	214(19.37)
Co-morbidity (%)			
No	1007 (44.716)	584(50.92)	423(38.28)
Yes	1245(55.28)	563(49.08)	682(61.72)
Emotional disorders N (%)			
No	2196(97.51)	1116(97.30)	1080(97.74)
Yes	56(2.49)	31(2.70)	25(2.26)
Disability N (%)			
No	2080(92.36)	1085(94.59)	995(90.04)
Yes	172 (7.64)	62(5.41)	110(9.96)
Subjective health scores (mean ± standard deviation)	73.31±11.99	74.74±12.39	71.83±11.36
Self-efficacy SECD6 (mean ± standard deviation)			
Self-efficacy mean score	6.53±1.28	6.89±1.32	6.16±1.12
Confidence in symptom control	6.54±1.29	6.94±1.32	6.13±1.11
Confidence in treatment	6.52±1.37	6.79±1.45	6.23±1.22
Social support CIRS (mean ± standard deviation)			
Chronic disease resource utilization parity score	3.72±0.49	3.75±0.52	3.69±0.45
Medical and nursing staff	4.23±0.53	4.23±0.48	4.23±0.58
Family and Friends	3.76±0.67	3.74±0.73	3.77±0.60
Neighborhoods and Communities	2.98±0.91	3.11±0.94	2.85±0.87

Table F.17 Self-management behaviors and life quality in people with diabetes

Variables	Both groups	Experimental group	Control group	p-value
Self-management behavior SDSCA (mean ± standard deviation)				
Total score	37.86±7.84	40.22±8.52	35.76±6.49	<0.001
Diabetic diet	5.42±1.43	5.43±1.34	5.42±1.34	0.8466
Healthy diet	5.15±1.11	5.28±1.24	5.05±0.98	<0.001
Exercise	2.65±2.07	2.84±2.05	2.49±2.08	<0.001
Blood sugar monitoring	1.23±1.05	1.60±1.12	0.90±0.87	<0.001
Footcare	1.54±2.19	2.02±2.45	1.11±1.82	<0.001
Medication adherence	5.94±2.21	6.03±2.33	5.87±2.09	0.6331
Life quality DSQL (mean ± standard deviation)				
Total sore	48.28±8.23	46.81±8.69	49.60±7.57	<0.001
Physiological functioning	2.00±0.46	1.93±0.47	2.06±0.44	<0.001
Mental state	1.77±0.35	1.70±0.38	1.82±0.31	<0.001
Social relations	1.34±0.28	1.31±0.27	1.36±0.28	<0.001
Treatment feelings	1.60±0.39	1.58±0.43	1.63±0.36	0.0055

Table F.18 Self-management behaviors and life quality in people with hypertension

Variables	Total groups	Experimental group	Control group	p-value
Self-management behavior HPSMBRS (mean ± standard deviation)				
Total Score	122.98±13.23	123.71±15.27	122.22±10.67	0.008
Diet	3.72±0.52	3.66±0.61	3.78±0.40	<0.001
Medication	4.82±0.52	4.87±0.45	4.77±0.57	<0.001
Emotions	3.57±0.85	3.53±0.94	3.61±0.74	0.030
Work and rest	4.13±0.64	4.09±0.66	4.17±0.61	0.002
Disease monitoring	2.40±0.58	2.66±0.64	2.13±0.34	<0.001

Variables	Total groups	Experimental group	Control group	p-value
Exercise	2.94±1.14	3.05±1.16	2.83±1.10	<0.001
Life quality QLICD-HY (mean ± standard deviation)				
Total score	194.35±12.43	196.51±12.30	192.10±12.17	<0.001
Somatic function	61.80±14.90	64.97±14.68	58.50±14.41	<0.001
Psychological functions	93.61±6.96	93.77±7.46	93.45±6.40	0.268
Social functions	82.05±11.56	82.90±11.90	81.17±11.14	<0.001
Hypertension-specific module	73.94±9.40	74.98±9.32	72.86±9.38	<0.001

Table F.19 Basic information of follow-up services to patients with diabetes

Variables	Rate (%)	95% CI		Population (N)
Frequency of follow-up visits				
1	1.99	0.0127	0.0310	19
2	17.70	0.1540	0.2025	169
3	48.27	0.4511	0.5145	461
4 and above	32.04	0.2915	0.3507	306
Items of follow-up visits				
Measuring blood sugar	99.37	0.9861	0.9972	949
Asking about diabetes-related symptoms	85.97	0.8361	0.8803	821
Asking about other diseases	61.05	0.5791	0.6410	583
Asking about taking medication	83.66	0.8118	0.8588	799
Asking about the treatment	42.93	0.3982	0.4610	410
Dissuading from smoking	14.55	0.1246	0.1694	139
Dissuading from drinking	10.79	0.0897	0.1292	103
Advising to moderate exercise	42.41	0.3930	0.4557	405
Persuading a low-fat diet	46.49	0.4334	0.4967	444
Persuading low salt diet	40.73	0.3765	0.4389	389
Follow up methods				
Home visits	99.37	0.9861	0.9972	949
Telephone calls	36.23	0.3324	0.3933	346
Outpatient follow-up	82.09	0.7953	0.8440	784

Table F.20 Basic information of integrated health management follow-up service for hypertension

Variables	Rate (%)	95% CI		Population
Frequency of follow-up visits				
0	0.09	0.0001	0.0062	2
1	2.79	0.0198	0.0393	32
2	20.09	0.1786	0.2251	230
3	46.29	0.4341	0.4919	530
4 and above	30.83	0.2822	0.3357	353
Items of follow-up visits				
Blood pressure measurement	98.87	0.9806	0.9934	1133
Asking about symptoms related to hypertension	83.68	0.8143	0.8571	959
Asking about other diseases	56.54	0.5365	0.5939	648
Asking about taking medication	81.76	0.7942	0.8390	937
Asking about the treatment	38.05	0.3527	0.4090	436
Dissuading from smoking	17.19	0.1511	0.1949	197
Dissuading from drinking	13.09	0.1126	0.1517	150
Advising to moderate exercise	41.88	0.3906	0.4477	480
Advising to a low-fat diet	45.20	0.4234	0.4810	518
Advising to low salt diet	41.19	0.3837	0.4407	472
Follow up method				

Variables	Rate (%)	95% CI		Population
Home visits	99.21	0.9850	0.9959	1137
Telephone calls	38.74	0.3596	0.4160	444
Outpatient follow-up	81.94	0.7960	0.8406	939

Table F.21 Regression results of the effect of integrated health management on self-management behavior and life quality of people with diabetes

Variables	Self-management behavior R^2 = 0.2830		Life quality R^2 =0.3875	
	Coef.	SE	Coef.	SE
Integrated Health Management (Reference: No)				
Yes	4.557***	0.316	-0.516*	0.307
Diabetes-related knowledge ADknowl	0.056***	0.010	0.015	0.010
Diabetes-related emotional state PAID	0.097***	0.022	0.391***	0.021
Self-efficacy SECD6	-0.438 ***	0.134	-1.351***	0.130
Social Support CIRS				
Medical and nursing staff	-4.102***	0.320	0.159	0.311
Family and friends	1.910 ***	0.255	2.959 ***	0.248
Neighborhoods and Communities	2.440 ***	0.180	-1.064 ***	0.175
Age (refer to <65 years old)				
≥65 years old	-0.563	0.343	1.073***	0.333
Gender (reference: male)				
Female	-0.694**	0.347	0.975***	0.337
Education (reference: elementary school and below)				
Junior High School	-0.045	0.432	-0.437	0.419
Technical secondary school or high school	0.329	0.617	-0.490	0.599
Technical college	0.598	2.156	-0.401	2.094
Bachelor's degree and above	1.554	3.361	-3.547	3.264
Income (reference: ≤¥1,000)				
1000-2000	1.057**	0.526	1.447***	0.511
2000-5000	-0.013	0.561	4.788***	0.545
＞5000	2.039***	0.562	1.520***	0.546
Co-morbidity (Reference: No)	-0.245	0.318	0.390	0.309
Emotional disorders (Reference: No)	2.248**	0.956	-1.256	0.928
Disability (Reference: No)	0.860	0.618	2.923***	0.600
Subjective health score	-0.040***	0.015	0.003	0.014
Constant term	40.329***	1.868	39.010***	1.814

Note: *** indicates p < 0.01, ** indicates p < 0.05, * indicates p < 0.1

Table F.22 Regression results of the effect of integrated health management on self-management behavior and life quality of people with hypertension

Variables	Self-management behavior R2 = 0.3290		Life quality R2 = 0.3485	
	Coef.	SE	Coef.	SE
Integrated health management (Reference: No)				
Yes	1.458***	0.489	0.880*	0.453

Variables	Self-management behavior R2 = 0.3290		Life quality R2 = 0.3485	
	Coef.	SE	Coef.	SE
Self-efficacy SECD6	-0.393*	0.206	2.374 ***	0.190
Social support CIRS				
Medical and nursing staff	7.360***	0.503	-4.732 ***	0.466
Family and friends	6.371***	0.387	1.906***	0.358
Neighborhoods and communities	2.020***	0.276	1.812***	0.256
Age (reference: <65 years old)				
≥65 years old	-1.602***	0.558	-2.087***	0.516
Gender (reference: male)				
Female	1.121 **	0.527	-1.657 ***	0.488
Education (reference: elementary school and below)				
Junior High School	-0.482	0.660	2.616***	0.611
Technical secondary college or high school	0.726	0.946	2.450***	0.875
Technical college	-0.471	3.914	10.127***	3.623
Bachelor's degree and above	3.069	6.321	-0.768	5.850
Income (reference: ≤¥ 1,000)				
1000-2000	2.524***	0.894	0.014	0.828
2000-5000	4.931***	0.930	-4.119***	0.861
＞5000	3.741***	0.944	-3.105***	0.873
Co-morbidity (Reference: No)	-0.405	0.474	-1.377***	0.439
Emotional disorders (Reference: No)	-3.580 **	1.486	3.397 **	1.375
Disability (Reference: No)	3.655 ***	0.968	-7.358***	0.896
Subjective health score	0.071 ***	0.022	0.256***	0.020
Constant term	55.951***	2.644	171.820***	2.447

Note: *** indicates $p < 0.01$, ** indicates $p < 0.05$, * indicates $p < 0.1$

Table F.23 Effect of follow-up services on self-management behaviors and life quality of patients with diabetes

Variables	Self-management behavior R^2=0.2891		Life quality $R^2 = 0.4246$	
	Coef.	SE	Coef.	SE
Frequency of follow-up visits (reference: ≤2 visits)				
＞2 visits	2.361***	0.715	-1.756***	0.656
Items of follow-up visits				
Chronic disease diagnosis and treatment services	-1.537***	0.466	-1.909***	0.428
Disease management guidance	-3.100 ***	0.472	-0.082	0.433
Health behavior guidance	0.926***	0.205	-0.163	0.188
Models of follow-up services				
Follow-up home visit (Reference: No)	-5.702*	3.031	-1.366	2.782
Follow-up telephone call (Reference: No)	-5.057***	0.587	-1.058**	0.539
Follow-up outpatient services (Reference: No)	0.076	0.758	1.857***	0.696
Diabetes-related knowledge ADknowl	0.044***	0.017	0.066***	0.015
Diabetes-related emotional state PAID	0.069**	0.033	0.516***	0.030
Self-efficacy SECD6	0.007	0.200	-0.445 **	0.184

Variables	Self-management behavior $R^2=0.2891$		Life quality $R^2 = 0.4246$	
	Coef.	SE	Coef.	SE
Social Support CIRS				
Medical and nursing staff	-3.513***	0.627	1.537***	0.575
Family and friends	0.619	0.434	1.741***	0.398
Neighborhoods and communities	2.621***	0.295	-0.392	0.270
Age (reference: <65 years old)				
≥65 years old	-0.149	0.533	1.304***	0.489
Gender (Reference: Male)				
Female	-0.090	0.556	1.165**	0.510
Education (reference: elementary school and below)				
Junior High School	0.567	0.711	-0.166	0.652
Technical secondary school or high school	-0.446	1.011	-1.141	0.928
Technical college	-1.874	3.726	0.889	3.419
Bachelor's degree and above	2.803	4.261	-5.004	3.910
Income level (reference: ≤1000RMB)				
1000-2000	0.998	0.800	1.153	0.734
2000-5000	0.916	0.836	3.550***	0.768
＞5000	3.477***	0.869	1.901**	0.798
Co-morbidity (Reference: No)	-0.888*	0.521	0.679	0.478
Emotional disorders (Reference: No)	1.583	1.476	-2.503*	1.354
Disability (Reference: No)	1.103	0.967	1.438	0.888
Subjective health score (reference: poor <50 points)	-0.156 ***	0.027	-0.112***	0.025
Constant term	64.114***	4.399	40.331***	4.037

Note: *** indicates $p < 0.01$, ** indicates $p < 0.05$, * indicates $p < 0.1$

Table F.24 Effect of follow-up services on self-management behavior and life quality of people with hypertension

Variables	Self-management behavior $R^2 = 0.4345$		Life quality $R^2 = 0.3361$	
	Coef.	SE	Coef.	SE
Frequency of follow-up visits (reference: ≤2 times)				
＞2 times	2.256**	0.973	-2.332***	0.850
Items of follow-up visits				
Chronic disease diagnosis and treatment services	-3.632***	0.649	0.277	0.567
Disease management guidance	0.020	0.676	-4.351***	0.591
Health behavior guidance	0.944***	0.305	-0.359	0.266
Models of follow-up services				
Follow-up home visit (reference: No)	3.441	4.159	0.726	3.634
Follow-up telephone call (Reference: No)	-3.787***	0.837	3.257***	0.731
Follow-up outpatient service (reference: no)	-2.582**	1.095	3.022***	0.957
Self-efficacy SECD6	0.730**	0.303	1.973***	0.265

Variables	Self-management behavior R^2 = 0.4345		Life quality R^2 = 0.3361	
	Coef.	SE	Coef.	SE
Social Support CIRS				
Medical and nursing staff	10.924***	0.876	-3.895***	0.766
Family and friends	4.874***	0.593	1.410***	0.518
Neighborhoods and communities	3.089***	0.421	1.890***	0.368
Age (reference: <65 years old)				
≥65 years old	-0.959	0.830	-2.539***	0.725
Gender (reference: male)				
Female	2.134***	0.802	-1.902***	0.701
Education (reference: elementary school and below)				
Junior High School	-0.075	0.989	2.758***	0.864
Technical secondary school or high school	0.140	1.332	3.873***	1.164
Technical college	8.972	6.785	8.393	5.929
Bachelor's degree and above	-7.526	8.267	-3.762	7.224
Income level (reference: ≤$1,000)				
1000-2000	3.349***	1.25	-1.655	1.092
2000-5000	5.674***	1.29	-3.292***	1.127
＞5000	5.452***	1.314	-1.323	1.148
Co-morbidity (Reference: No)	-0.004	0.708	-0.994	0.618
Emotional disorders (Reference: No)	-6.754***	2.176	2.943	1.902
Disability (Reference: No)	-6.639***	1.637	-4.568***	1.431
Subjective health score	-0.110***	0.038	0.087***	0.033
Constant term	54.500***	6.085	188.654***	5.317

Note: *** indicates $p < 0.01$, ** indicates $p < 0.05$, * indicates $p < 0.1$

Table F.25 Factors influencing self-management behaviors and life quality of diabetic patients in the control group

Variables	Self-management behavior R^2 = 0.3963		Life quality R^2 = 0.4498	
	Coef.	SE	Coef.	SE
Diabetes-related knowledge ADknowl	0.053***	0.011	-0.046 ***	0.012
Diabetes-related emotional state PAID	0.068**	0.027	0.176 ***	0.030
Self-efficacy SECD6	-0.962***	0.161	-2.796***	0.180
Social Support CIRS				
Medical and nursing staff	-4.276***	0.323	0.069	0.360
Family and friends	1.913***	0.294	2.198***	0.327
Neighborhoods and communities	3.061***	0.201	-0.926***	0.223
Age (reference: <65 years old)				
≥65 years old	-0.350	0.378	1.069 **	0.421
Gender (reference: male)				
Female	-0.452	0.368	0.904**	0.410
Education (reference: elementary school and below)				

Variables	Self-management behavior $R^2 = 0.3963$		Life quality $R^2 = 0.4498$	
	Coef.	SE	Coef.	SE
Junior High School	0.117	0.446	-0.366	0.497
Technical secondary school or high school	1.205 *	0.641	-0.412	0.714
Technical college	0.211	2.137	-0.976	2.380
Bachelor's degree and above	-5.825	5.132	-8.602	5.714
Income (reference: <¥1000)				
1000-2000	-0.464	0.629	1.251*	0.701
2000-5000	-2.443 ***	0.689	5.194***	0.767
＞5000	-0.390	0.665	0.906	0.741
Co-morbidity (Reference: No)	0.435	0.330	0.453	0.367
Emotional disorders (Reference: No)	1.197	1.084	-0.150	1.208
Disability (Reference: No)	-1.008	0.699	2.335***	0.779
Subjective health score	0.002	0.017	0.038 **	0.019
Constant term	41.168***	2.272	54.352***	2.530

Note: *** indicates p < 0.01, ** indicates p < 0.05, * indicates p < 0.1

Table F.26 Factors influencing self-management behavior and life quality in hypertensive patients in the control group

Variables	Self-management behavior $R^2 = 0.4028$		Life quality $R^2 = 0.4509$	
	Coef.	SE	Coef.	SE
Self-efficacy SECD6	-2.670 ***	0.247	2.994***	0.270
Social support CIRS				
Medical and nursing staff	5.575***	0.536	-4.168***	0.586
Family and friends	5.268***	0.474	1.582***	0.518
Neighborhoods and communities	1.450***	0.320	2.589***	0.349
Age (reference: <65 years old)				
≥65 years old	-2.297***	0.630	-1.330 *	0.688
Gender (Reference: Male)				
Female	0.636	0.575	-1.390 **	0.629
Education (reference: elementary school and below)				
Junior School	0.214	0.731	2.349***	0.799
Technical secondary school or high school	1.525	1.124	1.795	1.229
Technical college	-5.254	3.814	9.147**	4.170
Bachelor's degree and above	20.32**	8.393	6.058	9.176
Income (reference: ≤1000RMB)				
1000-2000	1.929	1.243	0.098	1.359
2000-5000	3.918***	1.307	-4.400***	1.429
＞5000	0.923	1.309	-3.468**	1.431
Co-morbidity (Reference: No)	-0.214	0.525	-2.424 ***	0.574
Mental diseases (Reference: No)	0.556	1.698	3.143 *	1.857
Disability (Reference: No)	6.851***	1.025	-8.092***	1.121
Subjective health score	0.215***	0.025	0.335 ***	0.028
Constant term	74.173***	3.426	159.107***	3.746

Note: *** indicates p < 0.01, ** indicates p < 0.05, * indicates p < 0.1
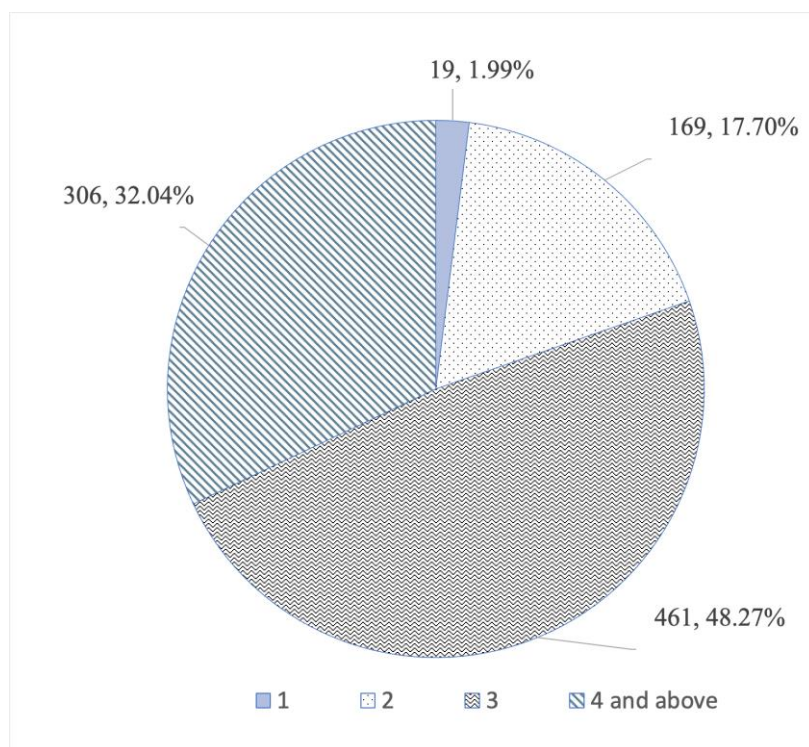
Annex G: Partial Results Figure

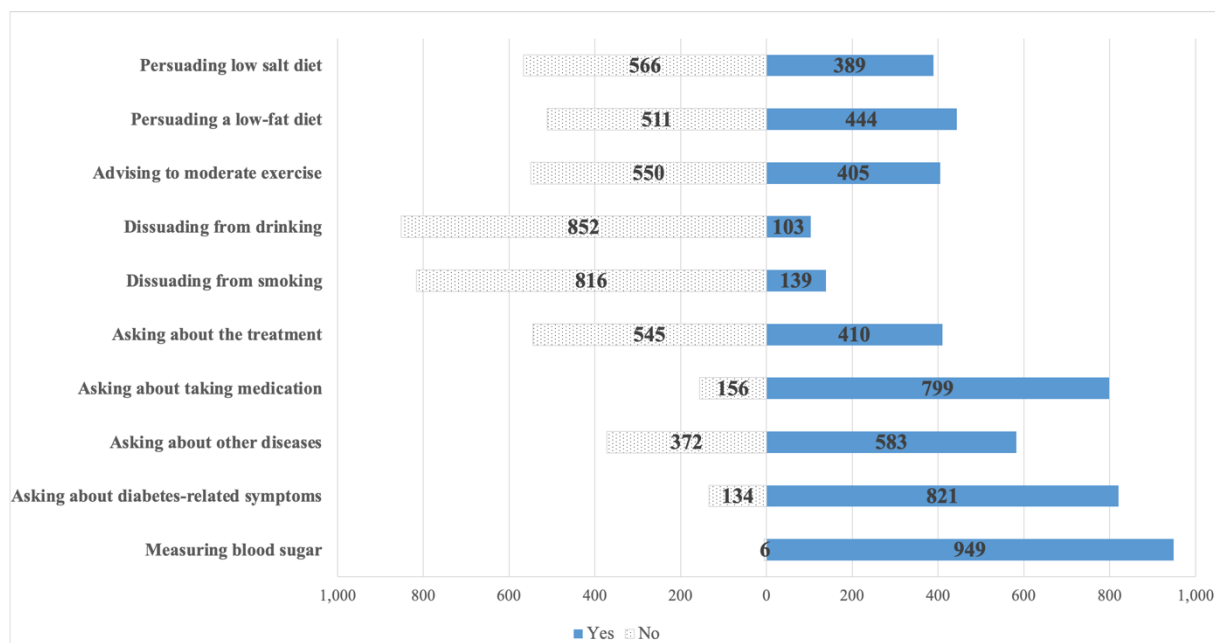Figure G.1 Frequency of follow-up visits to diabetic patients

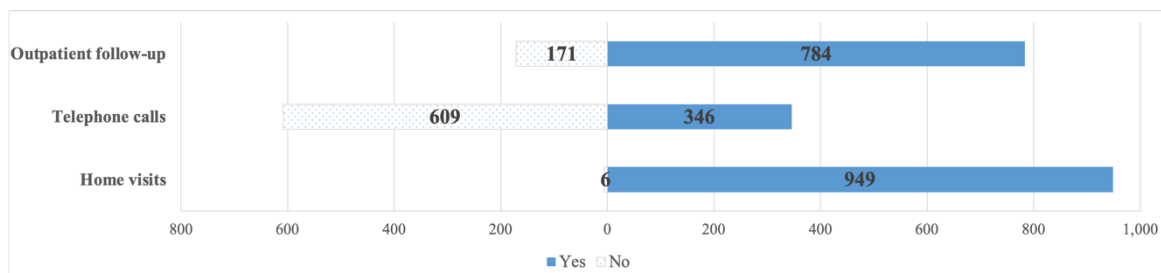Figure G.2 Follow-up programs for patients with diabetes

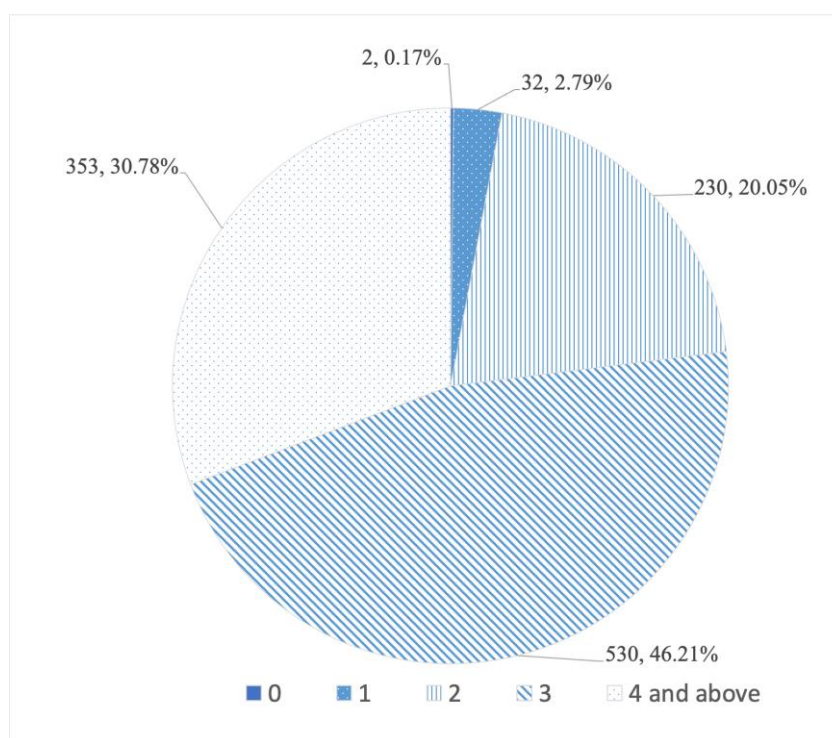Figure G.3 Models of follow-up visits

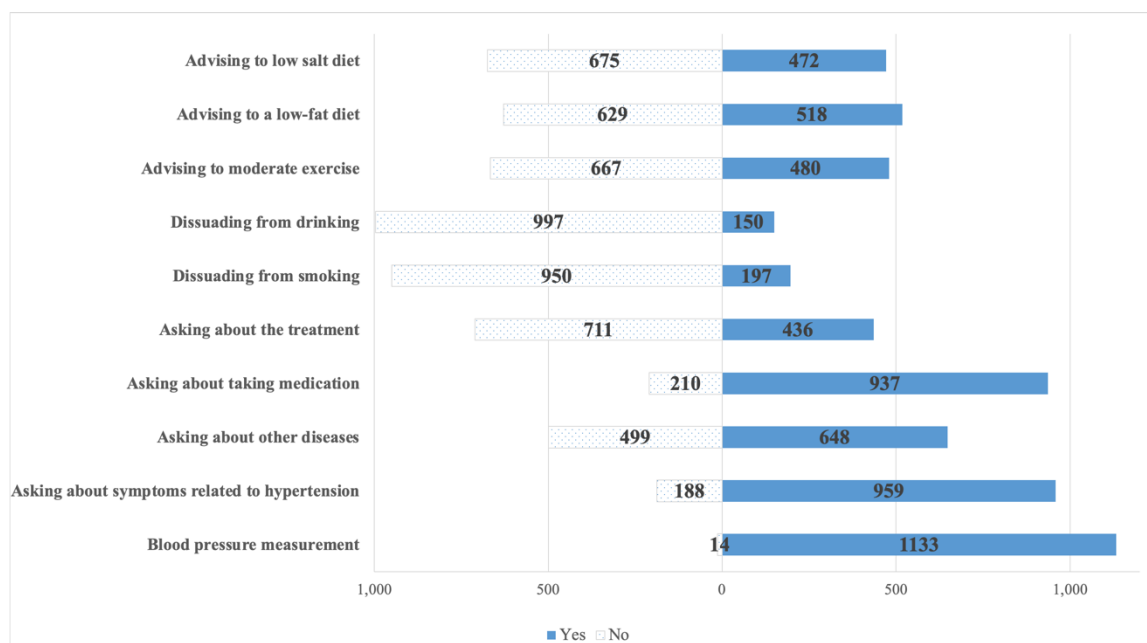Figure G.4 Frequency of follow-up visits to patients with hypertension
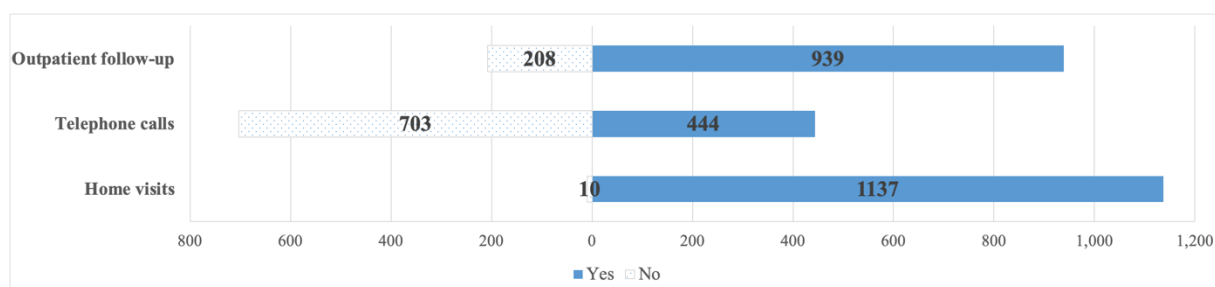

Figure G.5 Follow-up programs for hypertensive patients

Figure G.6 Model of follow-up visits to hypertensive patients