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Research on Integrated Medical-Nursing-Elderly Care Service Path for Elderly Chronic Diseases Under the Dual Strategic Guidance

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Abstract: Against the dual national strategies of ecological protection and high-quality development of the Yellow River Basin and healthy aging, prominent problems exist in the Yellow River coastal areas such as unbalanced supply and demand of long-term care services for elderly patients with chronic diseases and fragmentation of medical, elderly, and nursing services. Taking holistic governance and integrated nursing theories as the analytical framework, this paper adopts a combination of literature research, field investigation, case analysis, and expert interviews to conduct empirical research on urban and rural communities, primary medical institutions, and elderly care institutions in 9 cities of the Shandong Section of the Yellow River Basin. The study systematically sorts out the current situation and practical contradictions of regional care services for the elderly with chronic diseases. The study finds that the region is faced with practical dilemmas including disconnection between medical and elderly care, separation of nursing and elderly care, insufficient coordination of multiple subjects, unbalanced allocation of urban and rural resources, and shortage of compound care talents. Based on the differentiated regional development characteristics, this paper constructs a four-dimensional integrated medical-nursing-elderly care service system featuring "multi-subject coordination, service integration, closed-loop procedures and multi-dimensional support," and designs implementation paths from three dimensions of resource integration, grassroots implementation and regional balance. Meanwhile, a long-term guarantee mechanism integrating policy, talent, capital, supervision, and evaluation is established. The research results can provide theoretical support and practical reference for cities along the Yellow River in Shandong Province to improve health service policies for the elderly and promote the integrated development of medical, nursing, and elderly care, and boost the high-quality development of healthy elderly care in the Yellow River Basin.

Keywords: Shandong Section of the Yellow River Basin; Elderly chronic diseases; Integration of medical, nursing, and elderly care; Holistic governance; Long-term care

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1. Introduction

Foreign research on integrated care for elderly chronic diseases started in the middle and late 20th century, and an integrated nursing model centered on communities with multi-subject coordination has been formed. Closed-loop management of chronic diseases is realized by relying on standardized procedures and intelligent monitoring technologies. However, relevant models are built on the basis of balanced medical resources, which are difficult to adapt to China's local context featuring large urban-rural development gaps and differentiated regional resources in the Yellow River Basin [1]. Domestic academic circles have yielded abundant achievements on the integration of medical and elderly care as well as management of elderly chronic diseases, and some studies have touched upon elderly care services in the Yellow River Basin. Nevertheless, existing research mostly focuses on a single dimension of medical treatment, elderly care, or nursing separately, while special empirical studies targeting the integration of medical, nursing, and elderly care for elderly chronic diseases in the Shandong Section of the Yellow River Basin are relatively scarce [2]. Most existing achievements lack support from grassroots field surveys and fail to construct implementable integrated collaborative systems adapted to regional characteristics in combination with differentiated care demands of urban and elderly groups in the 9 cities along the Yellow River. Meanwhile, new technologies such as artificial intelligence-based chronic disease monitoring and online follow-up have not been deeply embedded into grassroots medical-nursing-elderly care service chains, and pain points including data barriers and service fragmentation have not been effectively solved [3].

With the implementation of policies such as the *Outline of the Plan for Ecological Protection and High-quality Development of the Yellow River Basin*, the *Healthy China 2030 Outline*, and the *14th Five-Year Plan for Elderly Care Service System of Shandong Province*, promoting in-depth integration of medical, nursing and elderly care for the elderly has become the core task of elderly health work in areas along the Yellow River [4]. The Shandong Section of the Yellow River Basin covers 9 cities along the Yellow River, including Jinan, Zibo, Dongying, Binzhou, Dezhou, Liaocheng, Heze, Jining, and Tai'an. The degree of population aging keeps deepening, and the number of elderly groups suffering from chronic diseases such as hypertension and diabetes is large, with rising demand for long-term care. Problems including unbalanced distribution of urban and rural medical, elderly and nursing resources, lack of inter-departmental coordination mechanisms, and disconnection of service links restrict the implementation of the healthy aging strategy. Under such a background, exploring an integrated medical-nursing-elderly care service system adapted to the Shandong Section of the Yellow River Basin bears important theoretical and practical value.

2. Definition of core concepts and theoretical basis

2.1. Definition of core concepts

The Shandong Section of the Yellow River Basin refers to the whole territory of 9 cities including Jinan, Zibo, Dongying, Binzhou, Dezhou, Liaocheng, Heze, Jining, and Tai'an where the main stream of the Yellow River flows in Shandong Province. It covers urban and rural communities, grassroots health centers, public and private elderly care institutions, serving as the spatial scope of this research [5]. Elderly chronic diseases refer to chronic diseases with high incidence among permanent residents aged 60 and above that require long-term continuous health management, with hypertension, diabetes, cardiovascular and cerebrovascular diseases, and bone and joint chronic diseases as core research disease types. Integration of medical, nursing, and elderly care means breaking administrative and industrial barriers among medical treatment, elderly care,

and nursing industries, integrating full-chain services including diagnosis and treatment, rehabilitation, long-term care, daily life care, health management and psychological counseling, and realizing an integrated care mode featuring seamless connection among medical institutions, elderly care institutions, communities and families [6]. Collaborative nursing system refers to a systematic care operation framework centered on the demands of elderly patients with chronic diseases, with multiple subjects including the government, medical institutions, elderly care institutions, communities, nursing staff, and elderly family members participating together, featuring clear powers and responsibilities, interconnected resources and closed-loop procedures.

2.2. Theoretical basis: Holistic governance theory

Centered on public demands, holistic governance theory advocates solving the problems of fragmented public services, separated subjects, and mismatched supply and demand through cross-departmental and cross-industry coordination and integration. At present, services for elderly chronic diseases in the Shandong Section of the Yellow River Basin are faced with fragmented dilemmas: medical and elderly care fall under the competent departments of health and civil affairs, respectively, with independent resources and isolated information and disconnected services, which are highly consistent with the core problems to be solved by holistic governance theory. Relying on holistic governance theory, this study coordinates powers and responsibilities of multiple subjects, integrates cross-industry service resources, and opens up information sharing channels to build an integrated collaborative service framework, providing theoretical support for system construction and operation mechanism design [7].

3. Investigation and analysis of medical-nursing-elderly care services for elderly chronic diseases in Shandong Section of the Yellow River Basin

3.1. Investigation design and implementation

This study adopts a mixed research method. Field visits are carried out in urban communities, township health centers, rural elderly service points, and private elderly care institutions in the 9 cities along the Yellow River. Structured questionnaires are distributed to the elderly over 60 with chronic diseases, one-on-one in-depth interviews are conducted with grassroots medical staff, elderly caregivers, and civil affairs and health workers, and industry forums are organized to collect frontline practical information. The investigation covers urban and rural areas with different resource endowments, including both public and private service institutions to ensure sample representativeness, and comprehensively collects first-hand data on regional chronic disease prevalence, care demands, service supply, and multi-subject coordination status.

3.2. Prominent existing problems of regional services

First, fragmented service supply with two-way disconnection between medical and elderly care as well as nursing and elderly care. Grassroots medical institutions focus on disease diagnosis and treatment without long-term rehabilitation and daily care services; elderly care institutions only provide daily life care without professional chronic disease diagnosis, treatment, and rehabilitation capacity; community health services mostly stay at the annual physical examination level, lacking continuous follow-up management for chronic diseases. Second, unbalanced allocation of urban and rural resources with prominent regional service gaps. Central urban areas along the Yellow River are equipped with Grade-II hospitals and comprehensive elderly care centers with sufficient resources for chronic disease rehabilitation and professional nursing; counties,

towns, and rural areas suffer from insufficient grassroots medical staff and low coverage of intelligent chronic disease monitoring equipment [8]. Third, vague powers and responsibilities of multiple subjects and absence of cross-departmental coordination mechanisms. Medical and elderly care belong to two management systems of health and civil affairs with no regular coordination discussion mechanisms; information systems among the government, hospitals, elderly care institutions, and communities operate independently, making it impossible to share chronic disease health files and elderly care records. Fourth, insufficient supply of professional talents and long-term guarantee mechanisms. There is a large gap in compound talents mastering clinical medicine, elderly rehabilitation, and long-term care at the grassroots level; existing nursing staff receive low salaries with high turnover rates; capital channels are single with low willingness of social capital participation; unified evaluation and dynamic supervision standards for medical-nursing-elderly care services are absent.

3.3. In-depth causes of problems

First, the implementation of top-level policies lacks refined supporting detailed rules for regional differentiation. Existing policies on the integration of medical and elderly care tend to provide macro guidance without differentiated implementation specifications formulated for urban-rural gaps in the Yellow River Basin. Second, long-standing inter-departmental governance barriers and absence of institutional constraints on cross-industry resource coordination and information sharing. Third, the talent training system is disconnected from grassroots demands, with insufficient majors related to integrated care for elderly chronic diseases offered in universities and vocational colleges. Fourth, diversified financing channels and service quality supervision systems have not been established, lacking institutional support for the long-term operation of integrated services.

4. Construction of integrated collaborative service system for elderly chronic diseases in Shandong Section of the Yellow River Basin

4.1. Multi-subject coordination framework with clear division of powers and responsibilities

Government: Civil affairs and health departments at provincial, municipal, and county levels conduct top-level design, issue supporting policies for integrated medical-nursing-elderly care in areas along the Yellow River, coordinate financial funds, carry out industrial supervision, and build regional health information sharing platforms. Medical institutions: Grassroots health centers and general hospitals take charge of chronic disease screening, diagnosis and treatment, rehabilitation guidance, two-way referral, and output of professional nursing technologies.

Elderly care institutions and communities: Undertake daily life care and basic health monitoring for residents living in concentrated areas, and provide home-based door-to-door care relying on community service stations.

Nursing teams and families: Full-time nursing staff provide professional services including rehabilitation and pressure sore care, while family members undertake basic home care, and both sides participate in chronic disease health management together [9].

4.2. Integration of full-chain service contents

Centered on the full-life-cycle demands of elderly patients with chronic diseases, six categories of integrated services are integrated: chronic disease screening and risk assessment, outpatient diagnosis and inpatient rehabilitation, long-term professional nursing, home-based daily care, health education and psychological comfort, intelligent monitoring, and follow-up. Standardized graded care plans are formulated for common chronic diseases such as hypertension and diabetes to realize seamless integration of medical, nursing, and elderly care services.

4.3. Closed-loop service operation procedures

A closed-loop process of "demand assessment – formulation of personalized plans – hierarchical classified service supply – dynamic health monitoring – feedback and optimization of effects" is established. When the elderly are first incorporated into the service system, comprehensive assessment of chronic disease grade and disability grade is completed; services including community home care, institutional elderly care and hospital rehabilitation are matched according to assessment results; health data such as blood pressure and blood glucose are collected in real time relying on intelligent equipment; regular follow-up is conducted to collect service satisfaction, and care plans are dynamically adjusted to form a continuously optimized service cycle.

4.4. Integrated comprehensive support carrier

Digital platforms are relied on to break regional health data barriers, integrate residents' electronic health files and elderly care files, and realize information interconnection among hospitals, communities, and elderly care institutions. Regional medical equipment, nursing beds, and professional talents are coordinated, and a counterpart allocation mechanism for urban and rural resources is established to provide hardware and data support for the implementation of integrated services [10].

5. Differentiated implementation paths and long-term guarantee mechanisms of the integrated service system

5.1. Three major implementation paths for implementation

Resource integration path: Break barriers among departments and institutions, build a comprehensive library of elderly care resources covering the 9 cities along the Yellow River, promote paired cooperation between hospitals and elderly care institutions, regular outpatient service of physicians and rotational exchange of nursing staff to realize complementary advantages of resources [11].

Grassroots sinking implementation path: Improve chronic nursing functions of community day care centers and township elderly service stations, and popularize door-to-door medical-nursing-elderly care services for home-based elderly.

Balanced regional development path: Design differentiated service modes for urban, county, and rural areas. Urban areas focus on institutional integrated care and intelligent chronic disease monitoring; counties improve the linkage mechanism between health centers and elderly care centers; rural areas promote the joint service mode of village clinics and village-level elderly service points, and narrow urban-rural care gaps through counterpart assistance of urban resources [12].

5.2. Four-dimensional long-term guarantee mechanism

Policy guarantee mechanism: Issue special implementation detailed rules for integrated medical-nursing-elderly care for elderly chronic diseases in the Shandong Section of the Yellow River to provide institutional constraints for system operation.

Talent guarantee mechanism: Support local colleges to set up majors related to integrated care for the elderly, carry out regular joint training for grassroots medical staff and elderly caregivers, improve salary incentive and professional title promotion preferential policies to stabilize grassroots compound care talent teams.

Capital guarantee mechanism: Build diversified financing channels featuring financial dominance, participation of social capital, appropriate inclination of medical insurance, and supplement of public welfare charities [13].

Evaluation and supervision guarantee mechanism: Establish a comprehensive evaluation index system covering chronic disease control effects, elderly satisfaction, multi-subject coordination efficiency and service standardization, and implement quarterly dynamic supervision.

6. Research conclusions and policy implications

6.1. Research conclusions

Prominent problems including fragmented services, unbalanced urban-rural resources, and insufficient multi-subject coordination exist in elderly chronic disease care in the Shandong Section of the Yellow River Basin [14–15]. Based on holistic governance theory, the constructed four-dimensional integrated medical-nursing-elderly care collaborative system can clarify powers and responsibilities of multiple subjects, integrate full-chain care services and form closed-loop operation procedures, which fits the differentiated development characteristics of areas along the Yellow River with strong operability. The implementation of the system needs to be matched with three implementation paths of resource integration, grassroots sinking and urban-rural balance. Meanwhile, a long-term guarantee mechanism shall be built from four dimensions of policy, talent, capital and supervision to realize sustainable operation.

6.2. Policy implications

At the provincial level, issue a special implementation plan for integrated medical-nursing-elderly care for elderly chronic diseases in the Shandong Section of the Yellow River, break administrative barriers between civil affairs and health departments, set up a cross-regional collaborative working group, and coordinate elderly health service resources of the 9 cities along the Yellow River. Improve urban and rural grassroots service carriers by classification, increase capital investment in medical-nursing-elderly service stations in counties and rural areas, popularize age-appropriate intelligent chronic disease monitoring equipment, and push high-quality medical and nursing resources down to towns and villages. Improve training and incentive policies for compound elderly care talents, smooth career development channels for medical and elderly nursing staff, and alleviate the shortage of professional grassroots talents. Build a unified digital sharing platform for elderly health in areas along the Yellow River, open data interfaces among medical and elderly care institutions, realize interconnection of chronic disease files and care records, and empower integrated collaborative services with digital technology.

6.3. Research limitations and prospects

This research only covers the 9 cities in the Shandong Section of the Yellow River without cross-provincial comparative analysis of areas along the Yellow River, and the scale of survey samples is limited. The research scope can be expanded in follow-up studies, and quantitative models can be introduced to measure the implementation effects of integrated services. In the future, artificial intelligence and remote follow-up technologies can be combined to further optimize the intelligent medical-nursing-elderly care service mode, explore the linkage mechanism between medical insurance payment and integrated care services, and continuously improve the integrated care system for elderly chronic diseases.

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Disclosure statement

The authors declare no conflict of interest.

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