

Research Progress on Integrated Medical-Nursing-Elderly Care Service System for Elderly Chronic Diseases in Shandong Section of the Yellow River Basin

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Abstract: Against the dual national strategies of healthy aging and ecological protection and high-quality development of the Yellow River Basin, the prominent problems of high incidence of chronic diseases among the elderly and fragmentation of medical, elderly, and nursing services in the areas along the Yellow River have become increasingly prominent. The Shandong section of the Yellow River Basin covers 9 prefecture-level cities including Jinan and Zibo. The distribution of urban and rural medical and elderly care resources is unbalanced, and the contradiction between supply and demand of long-term care for elderly patients with chronic diseases is prominent. This paper systematically sorts out the domestic and foreign research context on elderly chronic disease management and integrated medical-nursing-elderly care. Based on the regional characteristics of the Shandong section of the Yellow River Basin, it summarizes the existing research results from four dimensions: theoretical research, regional empirical research, system construction and implementation guarantee, analyzes the shortcomings and limitations of current research, and puts forward the optimization direction of future research combined with field survey data of this project. This study can provide theoretical reference for the construction of an integrated care system for older people in the Yellow River basin, and help improve the elderly health service policies and grassroots practice implementation in Shandong Province.

Keywords: Shandong section of the Yellow River basin; Elderly chronic diseases; Integrated medical-nursing-elderly care; Collaborative governance; Healthy aging

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1. Introduction

Accelerating population aging coupled with a high prevalence of chronic diseases has become a core issue

in China's public health and social governance fields ^[1]. The Outline of the Healthy China 2030 Initiative clearly proposes to promote standardized long-term management of elderly chronic diseases and build an integrated health service system combining medical and elderly care ^[2]. The Outline of the Yellow River Basin Ecological Protection and High-Quality Development requires overall planning of urban and rural people's livelihood security along the Yellow River and improvement of the supply mechanism of elderly health services ^[3]. As a core province in the lower reaches of the Yellow River, Shandong Province features an obvious urban-rural dual structure in the nine cities along the Yellow River. The rural elderly have a high prevalence of chronic diseases but lack professional nursing resources. Medical institutions, elderly care institutions, and community care services are separated from each other, and the coordination among medical treatment, elderly care, and nursing is insufficient, making it difficult to meet the demand for continuous closed-loop care of elderly patients with chronic diseases ^[4].

In view of the above, this project takes the elderly groups with chronic diseases in the Shandong section of the Yellow River Basin as research objects. Combining literature research, field investigation, case analysis, and expert consultation, it systematically sorts out the existing research in this field, summarizes theoretical and practical achievements, identifies research gaps, and provides a research basis for constructing a localized integrated medical-nursing-elderly care system ^[5].

2. Research progress on basic theories related to integrated medical-nursing-elderly care for elderly chronic diseases

2.1. Research on the application of collaborative governance and holistic governance theories

Holistic governance theory serves as the core supporting theory in the field of integrated elderly care. Centered on service recipients' demands, the theory advocates breaking departmental and industrial barriers and resolving the fragmentation of public services through resource integration and process coordination ^[6]. Existing theoretical research has obvious limitations: most literature only interprets the connotation of collaborative governance at a macro level, without localized adaptive analysis combined with the urban-rural resource gap and county economic disparities in the Shandong section of the Yellow River Basin. There is a lack of detailed theoretical frameworks for the division of powers and responsibilities of multiple stakeholders, including grass-roots health centers, community elderly service centers, private elderly care institutions, and family caregivers ^[7]. After sorting out existing studies, this project finds that the existing theoretical achievements fail to build a dedicated analytical model adapted to the aging characteristics of the lower Yellow River, leading to disconnection between theories and grass-roots chronic disease care practices.

2.2. Research on long-term care theories for the elderly

Elderly chronic diseases refer to hypertension, diabetes, cardiovascular and cerebrovascular diseases, and other chronic disorders with high incidence among people over 60 years old that require lifelong continuous management. Different from short-term in-hospital diagnosis and treatment, long-term care covers a full-chain service including screening, rehabilitation, daily care, and psychological counseling as well as follow-up monitoring ^[8]. Most existing studies focus on chronic disease management models in urban communities, while there are few studies on long-term care theories targeting left-behind elderly and low-income elderly patients with chronic diseases in rural areas of the Yellow River Basin. Rural elderly face long medical

distances and insufficient family caregivers with low penetration of intelligent monitoring equipment. Existing long-term care theories cannot cover special rural demands and fail to guide the implementation of grass-roots services in counties along the Yellow River ^[9].

2.3. Research on the definition of core concepts of integrated medical-nursing-elderly care

The academic circle has formed a basic consensus on the connotation of integrated medical-nursing-elderly care: breaking the industrial boundaries of medical treatment, elderly care and nursing, integrating three types of services including diagnosis and rehabilitation, daily living care and professional nursing, so as to realize seamless connection among home, community and institutional scenarios. However, existing studies have an ambiguous definition of the research scope targeting the Shandong section of the Yellow River. Some literature only carries out surveys in a single city along the Yellow River without incorporating the nine cities, including Jinan and Binzhou, into a unified analytical framework, ignoring the differences in economy and medical resources among upstream and downstream cities.

Meanwhile, existing studies fail to distinguish “integration of medical, nursing and elderly care” from “simple service superposition”. Most papers only put forward institutional cooperation models without clarifying the closed-loop standards of integrated services from the perspective of chronic disease management. There is a lack of definitions of age-friendly and chronic disease-specific integrated services, leaving room for innovation in concept reconstruction and framework construction of this project.

3. Regional empirical research progress on elderly chronic diseases and elderly care services in the Yellow River Basin

3.1. Research on aging and chronic disease distribution characteristics of the Yellow River Basin

In recent years, the temporal and spatial distribution of population aging in the Yellow River Basin has become a hot topic in regional sociology. Through panel data analysis, Qi Guangzhi et al. concluded that the aging growth rate of the Shandong section in the lower Yellow River is higher than that of the middle and upper reaches, and the proportion of the elderly population in counties along the southwest Shandong Yellow River keeps rising, with the aging degree of rural areas significantly higher than urban areas. Chronic diseases are characterized by “high prevalence and low standardized management rate”. The proportion of rural elderly patients with chronic diseases receiving standardized medication and regular reexamination is far lower than that of urban counterparts.

Most relevant studies are carried out from a macro demographic statistical perspective, only analyzing the spatial distribution rules of aging without supporting surveys combined with chronic care demands, lacking data on differentiated service demands of older people for home nursing, rehabilitation physiotherapy and door-to-door consultation, which cannot directly guide the construction of service systems ^[10]. Zhang Dechun et al. focused on the pension issues of landless rural elderly in the Yellow River Basin, yet only discussed economic support without covering chronic disease medical treatment and professional nursing, resulting in single research dimensions.

3.2. Research on the investigation of medical-elderly care service supply in Shandong Province

Shandong Province has issued the 14th Five-Year Plan for Elderly Care Service System and vigorously promoted the construction of community medical-elderly service centers and clinics inside elderly care institutions. Scholars in the province have carried out a series of investigations on medical and elderly care resources. Existing survey results confirm three common problems: first, unbalanced spatial resource allocation—high-quality medical resources are concentrated in cities such as Jinan and Zibo, while grass-roots medical institutions in counties along Heze and Liaocheng lack equipment and professional nursing staff; second, structural mismatch of service supply—institutional elderly care focuses on daily care while grass-roots hospitals focus on emergency treatment, leading to a huge supply gap in chronic disease rehabilitation and long-term home care; third, absence of multi-stakeholder coordination mechanisms—insufficient policy connection between health and civil affairs departments, disconnected information data and separated referral and follow-up processes ^[11].

3.3. Research on the application of AI intelligent technology in chronic disease management

Intelligent monitoring equipment, online AI follow-up, and big data platforms have become new ways to solve the shortage of grassroots care workforce. Pilot studies have proven that intelligent equipment can effectively improve the efficiency of chronic disease follow-up and give real-time health risk early warnings. Nevertheless, obvious shortcomings exist in existing technology application research: first, intelligent platforms fail to break data barriers between medical and elderly care institutions and realize data sharing; second, existing intelligent equipment is adapted to urban elderly without age-friendly transformation for rural elderly with low educational attainment and advanced age; third, technology application is not deeply integrated into the integrated medical-nursing-elderly care system and only serves as independent monitoring tools instead of being embedded into the full care closed loop. The rural elderly in the Shandong section of the Yellow River have low digital literacy, and localized empirical research on relevant technical schemes is almost blank.

4. Research progress on the construction and implementation path of integrated medical-nursing-elderly care system for elderly chronic diseases

4.1. Research on the framework of integrated service system

Domestic scholars have constructed multiple medical-elderly care service frameworks based on practices in different regions, mainly divided into institutional integration type, community embedded type, and home door-to-door type ^[12]. Existing frameworks generally have two defects: first, framework design fails to distinguish general elderly care from long-term chronic disease care, lacking exclusive service modules for chronic disease screening, rehabilitation, and complication intervention; second, most frameworks adapt to large and medium-sized cities without considering the weak resource status of counties and rural areas in the Yellow River Basin, resulting in the absence of differentiated urban-rural design.

Most existing studies divide service scenarios separately without constructing an integrated coordination framework of “multiple stakeholders—multi-dimensional services—full-process connection”, with vague division of powers and responsibilities among the government, hospitals, communities, and elderly care

institutions, and insufficient design of coordinated operation mechanisms, making the system difficult to implement.

4.2. Research on regionally differentiated implementation paths

The academic circle has put forward optimization paths such as resource sinking and counterpart assistance in response to the gap between urban and rural elderly care resources. However, the existing path design adopts a one-size-fits-all approach without hierarchical formulation of implementation strategies according to the economic level and medical resource endowments of cities in the Shandong section of the Yellow River. For counties along southwest Shandong with weak medical resources, there is a lack of low-cost and replicable simple integration schemes; for central cities such as Jinan, long-term paths for linkage and counterpart support between urban and rural areas are missing. Meanwhile, existing path research emphasizes service supply rather than demand matching, failing to design classified service paths based on stratified demands of elderly patients with chronic diseases (mild chronic diseases, severely disabled chronic diseases, solitary elderly), leading to insufficient service precision ^[13].

4.3. Research on long-term guarantee mechanisms

Guarantee mechanisms serve as the foundation for stable operation of integrated systems. Existing literature mainly discusses from three dimensions: policy, talents, and funds. From the policy perspective, existing studies propose to improve supporting regulations for medical-elderly integration but fail to sort out special supervision rules and cross-departmental incentive policies adapted to the Shandong section of the Yellow River. From the talent perspective, most studies point out the shortage of grass-roots nursing staff, yet lack training programs for compound chronic disease nursing staff jointly developed by universities, medical institutions, and elderly care institutions. From the capital perspective, most advocate increased government financial input, while insufficient research is carried out on social capital participation, public welfare assistance, and medical insurance payment connection mechanisms.

Existing studies generally ignore the evaluation and supervision mechanism, lacking an integrated evaluation system covering service quality, elderly satisfaction, and chronic disease management efficiency, making it impossible to optimize and adjust the system dynamically.

5. Core deficiencies of existing research

Fragmented research perspectives lacking an integrated vision covering all nine cities along the Yellow River. Most existing results separately study medical treatment, elderly care, or nursing as a single sector without systematic research combining the Yellow River Basin regional strategy, long-term care for the elderly with chronic diseases, and integration of medical, nursing, and elderly care. Comparative research among the nine cities along the Yellow River is scarce, leaving obvious gaps in regional special research.

Insufficient localized adaptation of theories. The theories of collaborative governance and integrated care are mostly copied directly from foreign or developed eastern regions without optimizing the theoretical framework combined with the practical characteristics of Shandong, such as a prominent urban-rural dual structure, uneven resource distribution, and serious rural aging, leading to severe disconnection between theories and grass-roots practices.

Incomplete empirical investigation and shallow analysis of supply-demand contradictions. The scope of existing surveys is narrow, with insufficient sample representativeness. Large-scale primary data covering urban, rural, institutional, and home scenarios are absent, and the root causes of coordination obstacles among grassroots institutions and differentiated care demands of elderly patients with chronic diseases are not thoroughly explored.

Low implementability of research achievements. Most existing system frameworks and implementation paths are macro theoretical designs without differentiated schemes adapted to resource-scarce counties and rural areas. There is a lack of operable achievements such as supporting policy suggestions and standardized operation manuals that can be directly transformed, making it hard to connect decision-making of local health and civil affairs departments and grass-roots implementation.

6. Optimization directions for future research

Construct a region-exclusive integrated analytical framework. Based on all nine cities in the Shandong section of the Yellow River, integrate collaborative governance and long-term care theories to build a closed-loop research framework of “regional characteristics–chronic disease demands–multiple stakeholders–integrated services–long-term guarantees”. Form stratified research models distinguishing urban and rural areas as well as mild and severe chronic diseases to fill gaps in regional special theories.

Carry out multi-dimensional empirical investigation covering the whole region. Expand the coverage of survey samples, simultaneously collect operational data of grass-roots institutions and demand data of elderly patients with chronic diseases, deeply analyze the underlying causes of urban-rural supply-demand mismatch and poor inter-departmental coordination, and accurately identify the targets for system construction.

Design differentiated and implementable integrated systems and implementation paths. Adopt the idea of “core framework + differentiated modules”, unify the basic coordination standards for medical, nursing and elderly care, and design adaptive paths for urban, county and rural scenarios respectively. Form a full closed loop covering chronic disease screening, diagnosis and treatment, rehabilitation and home care, and clarify the powers, responsibilities and linkage processes of all stakeholders.

Improve the four-dimensional long-term guarantee mechanism and promote achievement transformation. Build an integrated guarantee system including policy, talent, capital, evaluation and supervision, and form diversified achievements such as general research reports, policy suggestions, standardized service manuals and academic papers. Connect competent departments of Shandong Province and cities along the Yellow River to transform research results into operable plans and policy references for elderly health services ^[14,15].

7. Conclusion

The integration of medical, nursing, and elderly care for the elderly with chronic diseases in the Shandong section of the Yellow River is an important livelihood issue connecting the two national strategies of healthy aging and high-quality development of the Yellow River Basin. Current domestic and foreign relevant studies have accumulated phased achievements in basic theories, regional population statistics, and supply of medical-elderly care resources. However, prominent problems such as scattered research perspectives, weak localized theories, insufficient empirical surveys, and poor practical implementability still exist, and there is a large gap in systematic research on integrated care for older people covering all areas along the Yellow River.

Existing studies provide a theoretical foundation and practical reference for this project, and clarify core innovation directions including system construction, path design, and guarantee mechanisms. Through field surveys covering nine cities along the Yellow River, this project integrates interdisciplinary perspectives of sociology and nursing, and constructs a localized collaborative care system based on urban-rural development differences in the region to make up for the shortcomings of existing studies. Further in-depth research in this field in the future can effectively solve the fragmentation of elderly chronic disease care in areas along the Yellow River, optimize the supply of grass-roots health services, improve the quality of life of elderly patients with chronic diseases, and provide scientific support for Shandong Province to improve elderly health service policies and promote high-quality livelihood guarantee development in the Yellow River Basin.

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Disclosure statement

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