INSTITUTO
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Enhancement Pathways for Elderly Health Management Service Capability in Primary Medical and Health Care Institutions

CHEN Guihong

Doctor of Management

Supervisors:
PhD Rui Gonçalves, Assistant Professor,
ISCTE University Institute of Lisbon
PhD Chichen Zhang, Professor,
Southern Medical University

January, 2026

BUSINESS
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Marketing, Operations and General Management Department

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Abstract

Background and Objective: As a critical pathway to achieve healthy aging, elderly health management services rely on primary medical and health care institutions. However, there is no unified standard for evaluating the service capability of these institutions. This research aims to establish an evaluation system for the elderly health management service capability of those institutions in China, and to propose enhancement pathways. **Methods**: This research employed the SERVQUAL Model in conjunction with questionnaires, interviews, and the Delphi method to gather relevant data. The data was then analyzed using SPSS 26.0. **Results**: A survey of 1,882 elderly individuals aged 60 and above and 2 community health centers in Shenzhen revealed that 90.70% of the elderly expressed a need for health management services. Key influencing factors included self-rated health, service awareness, and family doctor contract enrollment. Service quality analysis revealed that the responsiveness dimension exceeded expectations, whereas assurance showed notable gaps. A multidimensional evaluation system was developed, comprising four domains (functional tasks, resource allocation, service content, and comprehensive management) and 45 indicators. A targeted improvement pathway was proposed, focusing on resource optimization, professional competency enhancement, digital empowerment, multi-department collaboration, and health education reinforcement. **Conclusion**: This research makes clear the "demand identification-policy response-utilization promotion" pathway in elderly health management, constructs a scientifically validated evaluation tool, and innovatively proposes a "demand-contract-supply" tripartite interaction model. Together, these contributions provide a cohesive theoretical foundation and actionable framework for advancing China's aging health service system.

Keywords: Health management services capability, Primary medical and health care institutions, Elderly people, Evaluation index system

JEL: I11, I18

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Resumo

Contexto e Objetivo: Enquanto via crítica para um envelhecimento saudável, os serviços de gestão de saúde do idoso apoiam-se nas instituições primárias de cuidados médicos e de saúde. Contudo, não existe um padrão unificado para avaliar a capacidade de serviço destas instituições. Esta investigação tem como objetivo estabelecer um sistema de avaliação da capacidade de serviços de gestão de saúde do idoso dessas instituições na China, e propor vias de melhoria. **Métodos:** Este estudo emprega o modelo SERVQUAL, recorrendo a questionários, entrevistas e o método Delphi para recolher dados relevantes. Os dados foram analisados com recurso ao software SPSS 26.0. **Resultados:** Um inquérito a 1.882 idosos com 60 ou mais anos e a 2 centros de saúde comunitários em Shenzhen revelou que 90,70% dos idosos manifestaram necessidade de serviços de gestão de saúde. Os principais fatores determinantes incluíram a autoavaliação do estado de saúde, a consciencialização sobre os serviços e a adesão ao contrato com médico de família. A análise da qualidade do serviço revelou que a dimensão da responsividade excedeu as expetativas, enquanto a confiança apresentou discrepâncias notórias. Foi desenvolvido um sistema de avaliação multidimensional, composto por quatro domínios (tarefas funcionais, alocação de recursos, conteúdo do serviço e gestão integrada) e 45 indicadores. Foi proposta uma via sistemática de capacitação, enfatizando a otimização de recursos, o reforço da competência profissional, a capacitação digital, a colaboração multidepartamental e o fortalecimento da educação para a saúde. **Conclusão:** Este estudo evidencia a via "identificação da procura-resposta política-promoção da utilização" na gestão da saúde do idoso, constrói uma ferramenta de avaliação cientificamente validada e propõe, de forma inovadora, um modelo de interação tripartida "procura-contrato-oferta". Em conjunto, estes contributos fornecem uma base teórica coerente e um quadro de ação viável para promover o sistema de serviços de saúde para a população idosa na China.

Palavras-chave: Capacidade de Serviços de Gestão da Saúde, Instituições de Saúde de Cuidados Primários, Idosos, Sistema de Indicadores de Avaliação

JEL: I11, I18

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摘 要

背景与目的：作为实现健康老龄化的重要途径，老年健康管理主要依托基层医疗卫生机构开展，但目前尚没有统一的服务能力评价标准。本研究旨在构建中国基层医疗卫生机构老年人健康管理服务能力的评价体系，并提出提升路径。**方法：**本研究通过SERVQUAL 模型结合问卷调查法、访谈法、德尔菲法开展研究。通过 SPSS 26.0 进行数据分析。**结果：**对深圳市 1882 名 60 岁及以上的老年人和 2 家社康中心的调查表明，90.70%的老年人表示需要健康管理服务。健康自评、服务知晓度及家庭医生签约显著影响服务的需求、利用与满意度。响应性（加权 SQ=0.08）表现最佳，保证性（加权 SQ=-0.12）表现最差。建立的评价指标体系包含 4 个维度（功能任务、资源配置、服务内容、综合管理）45 项指标。针对性地提出了资源优化、专业能力提升、数字化赋能、多部门协同与健康教育强化的提升路径。**结论：**本研究揭示了“需求识别-政策响应-利用促进”的老年人健康管理服务路径，构建了“需求-契约-供给”三元互动模型及多维评价工具，为完善老龄化健康服务体系提供了理论依据与实践范式。

关键词：健康管理服务能力，基层医疗卫生机构，老年人，评价指标体系

JEL: I11, I18

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List of Abbreviations

TQM Total Quality Management

EFQM European Foundation for Quality Management

PZB Parasuraman-Zeithaml-Berry (Founding trio of SERVQUAL)

SERVQUAL Service Quality (Measurement model)

PDCA Plan-Do-Check-Act (Deming Cycle)

SJ-XQ Shajing-Xinqiao Community

XX-HC Xixiang-Hangcheng Community

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Chapter 1: Introduction

This research examines the healthcare sector at the macro level, analyzing national and local policy support for primary healthcare services alongside societal health demands. At the meso level, it analyzes regional development contexts and distinctive patterns. At the micro level, it focuses on hospitals, healthcare personnel, and elderly patients as primary subjects, investigating internal mechanisms and service processes to identify challenges and areas for improvement. From a management perspective, this research adopts methodologies such as constructing evaluation indicator systems and conducting pathway analysis to develop a systematic capability assessment framework for primary healthcare institutions. This research is significant for two reasons. First, it holds significant theoretical value. Second, it provides practical guidance for government decision-making, institutional management, and service improvement. Ultimately, this research contributes to enhancing the overall quality of health management services for the elderly in China.

1.1 Research background

China is undergoing rapid population aging, which poses significant challenges to the health of the elderly population. As the population approaches a phase of negative growth, the challenges posed by population aging have emerged as a pivotal subject in contemporary academic research. According to the Seventh National Population Census, China's elderly population has reached 264 million, accounting for 18.7% of the total population (Ma et al., 2023). Among them, the population aged 65 and above accounts for 13.5% (217 million) of the country's total population (National Bureau Of Statistics Of China, 2024), highlighting the severity of the aging issue. Rising life expectancy, driven by socioeconomic development and advances in medical technology, has further accelerated the aging process. Over the past five years, the elderly population in China has been steadily growing, as shown in Figure 1.1. Based on demographic projections, the population aged 60 and above in China is expected to constitute 35.1% of the total population by 2050, positioning China as the country with the largest elderly population globally (Ansah et al., 2021; Mu & Zhang, 2011). In response to the demographic shift characterized by low fertility, low mortality, and low growth, China has strengthened its top-level design, as evidenced by the comprehensive deployment of the 14th Five-Year Plan on

aging. The primary objective of this plan is to establish a high-quality elderly care system with Chinese characteristics. The "Healthy China 2030" Plan delineates the health and healthcare policy principles of "centering on people's health, prioritizing primary care, and driving progress through reform and innovation," while emphasizing "persisting in prioritizing primary care" (Central Committee of the Communist Party of China, State Council, 2016). In 2020, the government proposed the implementation of a national strategy to proactively address population aging as part of the 14th Five-Year Plan (National People's Congress of the People's Republic of China, 2021).

Policy Guidance and Institutional Innovation: The Support System for Elderly Health Management is undergoing gradual improvement. The Chinese government has historically allocated significant resources to elderly health management. This commitment is evidenced by the issuance of a series of guiding documents and policy plans (as Table 1.1 shows). The Healthy China 2030 Plan explicitly calls for the establishment of a service system centered on prevention and the integration of health management throughout the entire life cycle. The plan also reinforces the core role of primary medical and health care institutions in health management. This policy framework provides robust institutional support and policy safeguards for primary medical and health care institutions in delivering elderly health management services, while also providing direction for related mechanism innovations. In accordance with these policies, local governments and medical institutions have initiated the exploration of elderly health management models that are customized to regional characteristics. The phenomenon of institutional innovation can be observed in two primary domains. These innovations primarily involve optimizing resource allocation to enhance the service functions of primary institutions, and promoting multi-departmental collaboration to establish a demand-driven, comprehensive health management system. A notable example is Bao'an District in Shenzhen, which has substantially increased investment in primary healthcare. This strategy, encompassing policy support, financial subsidies, and talent recruitment, has effectively enhanced the service capability and management standards of local primary institutions.

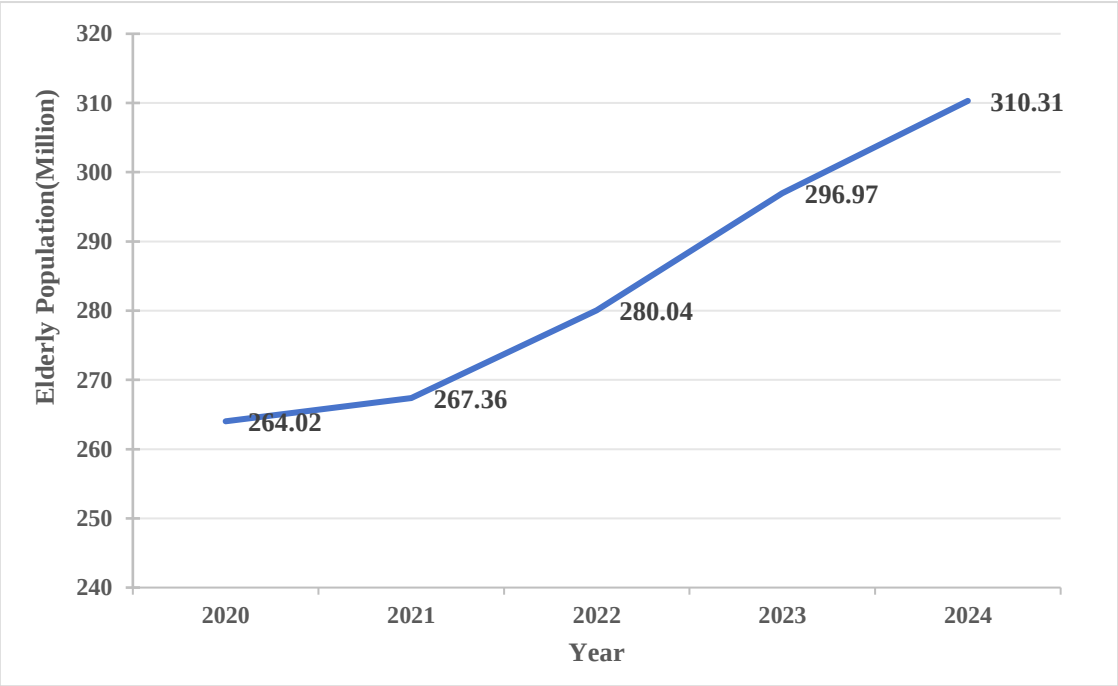


Figure 1.1 The number of elderly people in China from 2020 to 2024

Source: National Working Commission on Aging (2024)

A key aspect of this institutional innovation involves the establishment of medical consortiums, the development of collaborative mechanisms within these consortiums, and the implementation of family doctor contract services. These measures are instrumental in building a integrated health management network. This network is community-based, family-centered, and professionally supported by medical institutions. This integrated approach improves the continuity and coordination of care for the elderly, which is essential for maintaining their long-term health and functional ability. Consequently, this approach not only enhances resource utilization efficiency but also establishes a replicable model for scaling up health management services. A substantial body of research indicates that primary medical and health care institutions act as "health gatekeepers" in areas such as early intervention, disease screening, and health records management. The enhancement of service capabilities has been demonstrated to reduce the risk of elderly individuals falling into poverty or relapsing into poverty due to illness.

Table 1.1 List of national, provincial, and municipal policies

Levels	Policies	Related contents
National	Basic public health services (National Health Commission of the People's Republic of China, 2022).	Provide annual complimentary health management services to permanent residents aged 65 and above, including physical examinations, chronic disease management, and health guidance, covering primary medical and health care institutions nationwide.

Levels	Policies	Related contents
Provincial	Implementation Plan for Promoting High-Quality Development of the Silver Economy and Enhancing the Well-being of the Elderly in Guangdong Province (General Office of the People's Government of Guangdong Province, 2025)	A series of 20 measures have been proposed, including: the completion of age-friendly renovations for 120,000 households with elderly residents facing special difficulties by 2027; the assurance that geriatric medicine departments account for 85% of secondary and higher-level general hospitals; the development of smart wellness and anti-aging industries; and the establishment of age-friendly living experience centers.
Provincial	Implementation Plan for Advancing Health Management of Elderly Residents in Urban and Rural Communities Through Family Doctor Contract Services to Fulfill Provincial Government's Livelihood Initiatives (Health Commission Of Guangdong Province, 2024)	6 Key Tasks: Quarterly health education campaigns, establishing senior-friendly medical institutions (82% coverage by 2023), free physical examinations and Traditional Chinese Medicine constitution identification, family doctor contract services, home medical care (home hospital beds), and primary-level medication security (long-term prescription services).
Provincial	Advances Reforms for the Elderly and Children Establishing Health Management Service Systems for Seniors and Children-Guangdong Province (Health Commission Of Guangdong Province, 2024)	Establish a service model integrating “family doctor contracts, home-based medical beds, and elderly care beds”; By the end of 2023, the province will have 540 medical-care integration institutions, providing free physical examinations and health management services to 7.08 million seniors aged 65 and above.
Municipal	Action Plan for High-Quality Development in Health and Wellness (2025)-Shenzhen (Shenzhen Municipal People'S Government, 2024)	Increase the proportion of geriatric medicine departments in public general hospitals at level II and above to 85%, expand community health institutions to 1,000 facilities, and implement six major geriatric health promotion initiatives (including hearing preservation and health services for elderly individuals with disabilities).

In the context of national strategies, such as "Healthy China" and "Proactively Addressing Population Aging," which incorporate elderly health management into the equalization of basic public health services, regional governments are tasked with translating these top-level plans into accessible and sustainable community-level service provision. Shenzhen, as a frontier city of China’s reform and opening-up, is witnessing the approaching aging of entrepreneurs who settled in the city in the 1990s. Concurrently, as a highly livable city, Shenzhen has experienced a growing influx of parents of young entrepreneurs. This demographic shift has imposed pressing demands on the health management capability of primary healthcare institutions. Shenzhen, a prominent megacity in China, exemplifies this challenge and commitment. According to the 2020 Seventh National Population Census, Bao'an District is home to one-quarter of Shenzhen's permanent population. It operates 188 community health service centers,

a figure that indicates a substantial allocation of primary healthcare resources relative to its population size.

Health management is an important component of the national basic public health services. Primary medical and health care institutions function as the gatekeepers of public health and the primary providers of grassroots medical services, offering fundamental healthcare safeguards. The strategic positioning of these facilities, in close proximity to residential areas and with consistent service coverage, has led to their emergence as pivotal entities in the realm of public health management. These medical centers have become the preferred option for accessing fundamental medical services, owing to their convenient locations and reliable operational histories (Liu et al., 2022). Despite these advantages, the current imbalance in the allocation of public service resources persists. While public demand for healthcare services continues to grow, primary healthcare institutions still face significant shortcomings in service capability, coverage, and resource distribution, leading to an increasingly acute supply-demand gap. In 2021, the General Office of the State Council issued the "Opinions on Promoting High-Quality Development of Public Hospitals," explicitly calling for efforts to enhance the service capability and management standards of primary medical and health care institutions to improve public health levels. In 2022, the Shenzhen Municipal Government released the “Shenzhen Health Development Plan for the 14th Five-Year Plan Period”, requiring continuous consolidation of the foundational roots of primary healthcare groups, elevating the level of primary healthcare services, and striving to provide higher-quality health services to citizens. Additionally, population aging has led to a comprehensive decline in physical health functions and a continuous rise in chronic disease prevalence, driving increased healthcare demand. Particularly, the growing number of elderly individuals with chronic conditions has placed significant medical pressure on primary healthcare institutions (Chen et al., 2022; J. Zhou et al., 2023).

Therefore, health management serves as a crucial pathway to achieving healthy aging, with primary healthcare institutions playing a central role in providing health management services for the elderly. However, there is currently no unified standard for evaluating the elderly health management services offered by these primary institutions. Additionally, research on constructing capability improvement pathways based on such evaluations remains limited, underscoring an urgent need for further research and practical exploration in this area. Consequently, in accordance with the contemporary health philosophy of transitioning from a "disease-centered care to a people-centered health" paradigm, this dissertation endeavors to enhance the health management service capability for community-dwelling elderly in Bao'an

District. The research is anchored in the domain of elderly health management services within primary medical and health care institutions, with the objective of providing policy foundations and effective pathways for addressing challenges such as population aging and the prevalence of chronic diseases. This research aims to explore the pathways for enhancing elderly health management service capabilities in primary healthcare institutions. This study analyzed existing elderly health management policies and collected supplementary data on policy implementation and public demand through questionnaires and semi-structured interviews. Furthermore, an evaluation index system for elderly health management service capabilities was developed for primary healthcare institutions, incorporating pivotal input from domain experts. Based on the established evaluation index system, primary medical and health care institutions in Bao'an District undertake self-assessments to evaluate their compliance with each health management indicator. This process identifies existing gaps and deficiencies, leading to the formulation of improvement pathways. The ultimate goal is to establish a customized model for enhancing service capability that aligns with the unique characteristics of Bao'an District.

1.2 Research objective

Given the current lack of an evaluation system for grassroots-level elderly health management services and the unclear pathways for capability enhancement, this study proposes the following three objectives:

(1) To investigate the current supply and demand status and core gaps in grassroots-level elderly health management services.

With the rapid growth of the elderly population, their demand for health management services is becoming increasingly diverse and personalized. However, primary medical and health care institutions face significant shortcomings in resource allocation and service content (Wang & Tao, 2023), necessitating a systematic assessment of the gap between current service provision and the needs of the elderly. This study seeks to identify service deficiencies and core supply-demand gaps through questionnaire surveys and data analysis, thereby providing data-driven support for targeted improvements.

(2) Constructing a comprehensive evaluation index system for grassroots-level elderly health management service capability.

The absence of a unified and scientifically-grounded evaluation index system for the service capability of primary institutions has resulted in inconsistent service quality. As the primary force in elderly health management, primary medical and health care institutions lack

a systematic and scientific indicator system for evaluating their service capability. This results in inconsistent service quality and an inability to meet the diverse health needs of the elderly (Chen et al., 2024). Utilizing Bao'an District, Shenzhen as a case study, this research will develop a scientific evaluation index system by applying methods such as the Delphi expert consultation method. This system will provide primary medical and health care institutions with an evaluation tool that is both scientifically sound and operationally feasible.

(3) To explore pathways to enhance service capability.

Existing research largely remains at the problem diagnosis stage, lacking pathways to translate evaluation indicator systems into practical improvement plans. In particular, actionable recommendations for primary medical and health care institutions are scarce. This research will apply the newly developed evaluation index system through field studies at multiple primary institutions to identify deficiencies (Guo et al., 2023). Through organizing and analyzing the survey results, it identifies shortcomings and deficiencies in elderly health management services at these institutions to formulate actionable pathways and evidence-based recommendations for service enhancement.

1.3 Research significance

The study contributes theoretically and practically, with specifics elaborated in the following sections:

1.3.1 Theoretical significance

(1) This research deepens the theoretical understanding of health management services for the elderly in primary medical and health care institutions. By examining the capability for elderly health management services within the broader context of the primary medical and health care service system, it systematically reveals the common patterns and essential characteristics of such services in primary medical and health care institutions. This provides a theoretical foundation for enriching and advancing research on health management services for the primary institutions.

(2) This research enriches the theoretical framework of health management services for the elderly. Based on the SERVQUAL Model, the research employs research methods such as interview surveys and the Delphi method to develop an evaluation index system from multidimensional perspectives, including resource allocation and service content. This research broadens the scope of through the provision of a new analytical framework that allows for that

allows for a comprehensive understanding of its constituent elements and operational mechanisms.

(3) This research provides a theoretical framework for evaluating health management services for the elderly. The evaluation indicator system, developed through expert consultation, offers a theoretical reference for standardizing the assessment of this capability in primary medical and health care institutions.

1.3.2 Practical significance

(1) This research provides a reference evaluation tool for health administrative departments to manage elderly health services at primary medical care institutions. The four-dimensional evaluation indicator system developed in this research is designed to be practical, enabling departments and can serve as a practical tool for departments, such as the National Health Commission, to supervise the quality of and assess the performance of elderly health management services. This facilitates the establishment of a routine, refined quality evaluation mechanism.

(2) This research provides primary medical and healthcare institutions with a roadmap for continuously improving their health management services for the elderly. By conducting systematic evaluations to identify service gaps, these institutions can generate targeted recommendations. These, in turn, help to pinpoint weak and critical areas precisely, formulate targeted corrective measures and achieve sustained improvements in the quality of health management services for the elderly.

(3) This research provides valuable insights for advancing the high-quality development of health management service systems for the elderly in primary medical and health care institutions. The optimised practices in elderly health management services can be extended and promoted to other primary preventive healthcare domains, such as chronic disease management, integrated medical and nursing care, and family doctor contract services. The optimized practices identified through this research have the potential to serve as a reference model for other primary preventive healthcare domains, thereby elevating the overall quality and capabilities of primary medical and healthcare services.

1.4 Research framework and methods

Focused on the “Pathways for Enhancing Health Management Service Capabilities for the Elderly in Primary Medical and Health Care Institutions,” this research addresses the urgent

needs of China's aging society while aligning with national health policies. From a management perspective, it concentrates on optimizing service models, service processes, and management mechanisms. Through comprehensive analysis at macro, meso, and micro levels, it explores the existing problems and challenges in elderly health management services at primary medical and health care institutions from the perspective of service recipients, providing a basis and guidance for improvement pathways.

First, from a research perspective, this research constructs a macro-meso-micro research framework. This framework analyzes macro-level policy drivers, meso-level institutional configurations, and micro-level service delivery processes to provide a comprehensive understanding. At the macro level, it examines the health sector context, including key areas such as national public health policies, healthcare system reforms in an aging society, medical insurance system development, and social health promotion mechanisms. Against the backdrop of accelerating global and domestic aging trends, national and local governments have successively introduced a series of policy measures aimed at strengthening the role of primary medical and health care institutions in preventive healthcare, health management, and chronic disease prevention and control. By examining and analyzing the macro-policy environment, this research identifies the policy drivers, institutional safeguards, and external environmental influences thereby identifying the foundational elements for developing pathways to enhance service capabilities.

At the meso-level, the focus shifts to regional development dynamics and healthcare system configurations. Bao'an District in Shenzhen serves as a typical case, characterized by rapid economic development and urbanization, which coexists with diverse aging-related demands and complex public health challenges. At this level, the research examines challenges common to the region, such as strained medical resources and insufficient service coverage, which are exacerbated by the aging population. It also explores how the district can learn from successful models in other regions to promote a more rational and efficient allocation of healthcare resources. Simultaneously, they need to draw upon successful experiences and innovative models from advanced regions to promote the rational allocation and efficient utilization of healthcare resources within the district. An analysis of Bao'an District's existing healthcare service system reveals current shortcomings and areas for improvement in talent allocation, technical equipment, service processes, and information technology infrastructure.

At the micro level, the focus narrows further to the smallest organizational units and individuals, such as specific hospitals, healthcare providers, and elderly populations. From this level, research will delve into operational mechanisms, management models, service processes,

and innovative initiatives within primary medical and health care institutions. At this level, the research will investigate: (a) how healthcare providers can optimize elderly health management processes through enhanced professional skills and service awareness; (b) the role of information technology in innovating services such as health records, telemedicine, and personalized interventions; and (c) how the diversity of elderly health needs and behaviors creates new demands on institutional service models. Through in-depth micro-level research and case studies, pain points and bottlenecks in service delivery can be effectively identified, thereby providing an empirical basis for developing targeted capability-building strategies.

From a management perspective, this research will focus on constructing an evaluation indicator system and exploring implementation pathways. In the practice of elderly health management at primary medical and health care institutions, traditional management models often struggle to adapt to increasingly diverse and specialized health needs. Therefore, from a demand-oriented research perspective, this study integrates the Service Quality Gap Theory, Total Management Theory, and Dynamic Capability Theory. By employing the SERVQUAL Model to accurately capture the actual needs of the elderly population, it aims to construct a scientific evaluation index system that aligns with the actual conditions of grassroots-level healthcare institutions. This will facilitate the development of a scientific evaluation indicator system tailored to the practical realities of primary medical and health care institutions. Furthermore, the study will explore pathways to identify context-specific strategies for enhancing service capability, taking into account evolving policies, technologies, and the health needs of the elderly. Guided by the Dynamic Capability Theory, this research will systematically examine these issues across macro, meso, and micro levels by comparing advanced domestic and international experiences and integrating case studies from Bao'an District. It will propose actionable enhancement strategies and implementation pathways.

This research develops a detailed technical roadmap (see Figure 1.2) to ensure a systematic and scientific approach. The roadmap primarily comprises four key steps: status quo investigation; evaluation indicator system construction; empirical research; and development of improvement pathways and strategic recommendations.

Current Status Survey: Based on literature review and focus group discussions, a questionnaire was designed using the SERVQUAL Model and existing literature to conduct a survey, aiming to gain an in-depth understanding of the current status of elderly health management services. Evaluation Indicator System Construction Phase: The Delphi method was employed to construct an evaluation indicator system tailored for health management services for the elderly in primary medical and health care institutions in China. Empirical

Research Phase: Using the questionnaire survey method, a comprehensive evaluation was conducted on selected community health centers using the constructed evaluation indicator system. In the final phase, dedicated to developing improvement pathways and strategies, specific enhancement pathways and strategic recommendations were proposed based on the findings from the preceding research phases.

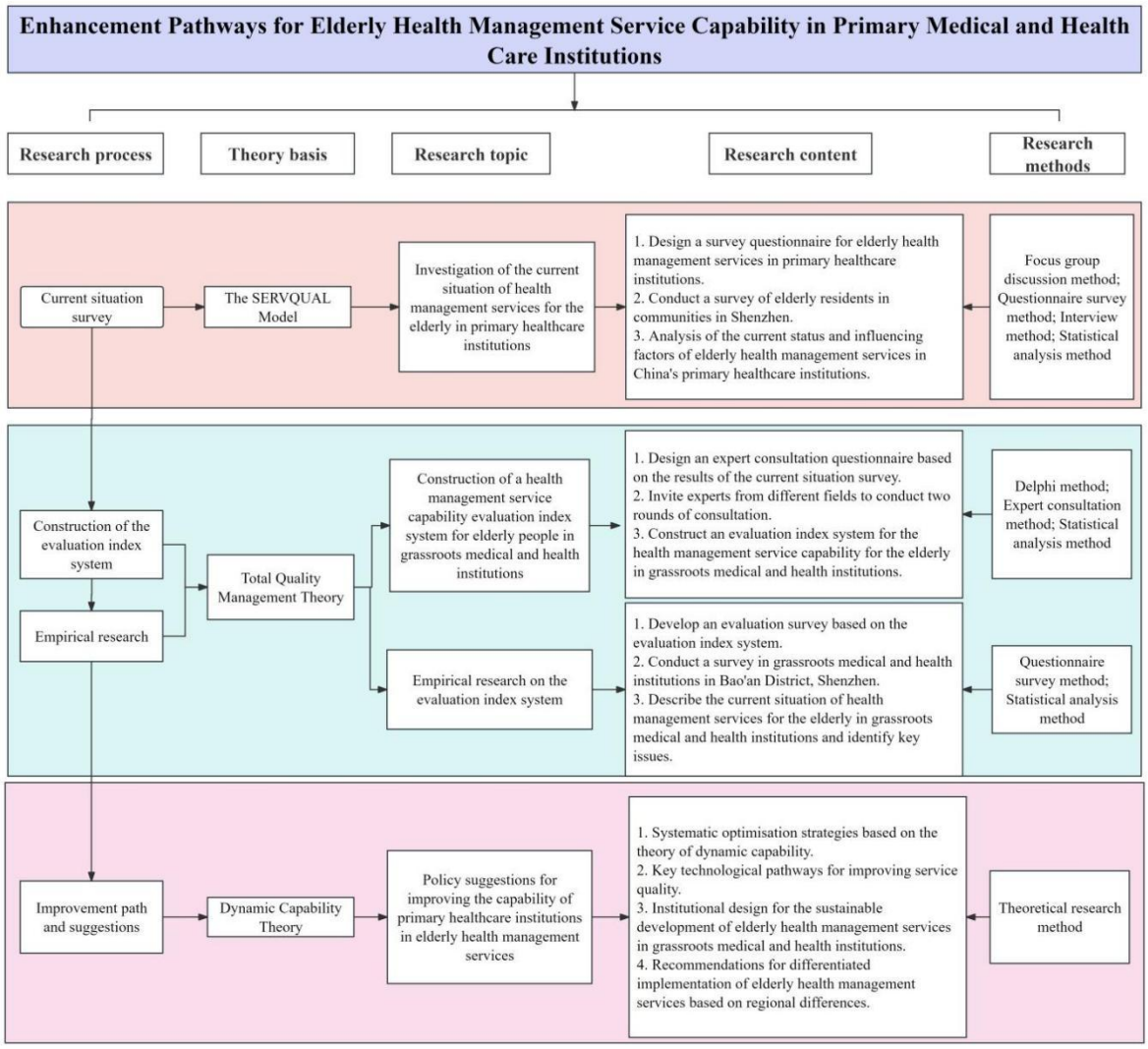


Figure 1.2 Technical roadmap

1.5 Research structure

The full text is divided into eight chapters: Chapter One, Introduction, begins with the research background and questions, establishes the research objectives and thesis framework. Chapter Two, Literature Review, systematically organizes theories and practices related to healthy aging, primary healthcare services, and health management, laying the theoretical foundation. Chapter Three, Research Methodology, elaborates on methods such as focus group discussions, the

Delphi method, questionnaire surveys, and statistical analysis. Chapter Four, Current Situation Investigation, reveals the status of health management services for the elderly through questionnaire surveys and interviews. Chapter Five, Construction of the Indicator System, establishes a health management service capability evaluation system covering four dimensions based on findings from the current situation investigation and expert consultations via the Delphi method. Chapter Six, Empirical Study, takes Bao'an District of Shenzhen as a case study to validate the evaluation indicator system and identify weaknesses in health management services. Chapter Seven, Countermeasures and Suggestions, proposes systematic strategies for improving health management service capability at macro, meso, and micro levels. Chapter Eight, Conclusion and Outlook, summarizes the research findings and contributions, while addressing limitations and future prospects. These chapters progress logically, forming a complete research cycle from problem identification to solution formulation.

The research will be conducted in four sequential phases. Phase 1: Situational Analysis and Tool Development. A comprehensive literature review and policy analysis will be conducted to assess existing evaluation frameworks for elderly health management services in primary healthcare institutions, both domestically and internationally, identifying their strengths and weaknesses. This study, based on the SERVQUAL Model, designed a questionnaire for investigating elderly health management services in primary healthcare institutions by drawing on existing literature. Through focus group discussions and questionnaire surveys, on-site investigations were conducted among elderly community residents to understand the current status and identify existing issues in elderly health management services provided by primary healthcare institutions..Phase 2: Evaluation System Construction. The Delphi method, leveraging expert consultation, will be used to construct a robust evaluation indicator system for assessing the elderly health management service capabilities of primary institutions. Phase 3: Empirical Investigation. The newly developed evaluation system will be operationalized into a structured questionnaire and applied in an empirical study of primary institutions in Bao'an District to diagnose specific weaknesses in their elderly health management services. Phase 4: Strategy Formulation. Based on the integrated findings from all previous phases, actionable improvement pathways and policy recommendations will be proposed to enhance service capability.

1.5.1 Survey on the current status of health management services for the elderly in primary medical and health care institutions and theories

This research begins with a comprehensive examination of the current state of elderly health

management services in primary healthcare institutions, both domestically and internationally. It systematically reviews practices concerning hardware facilities, staffing, service processes, and satisfaction evaluations, with a particular focus on the applicability and effectiveness of existing assessment tools. Furthermore, through a comparative analysis of domestic and international systems, the study identifies key differences and commonalities. This comparative perspective allows for the integration of advanced international experiences to optimize service capabilities within China's primary institutions. The research is grounded in an integrated theoretical framework combining Service Quality Gap Theory, Total Quality Management Theory, and Dynamic Capability Theory. These theories offer complementary perspectives. By employing the SERVQUAL Model, this study identifies potential gaps in various aspects of elderly health management services provided by primary healthcare institutions. Guided by the comprehensive quality management theory centered on the PDCA (Plan-Do-Check-Act) cycle, it enables systematic and continuous improvement of service processes. Concurrently, the dynamic capabilities theory is introduced to explain how primary institutions, through the dynamic capabilities of "sensing-integrating-reconfiguring," respond to the diverse and fragmented health needs of the elderly population. This approach comprehensively and accurately captures the core elements of the elderly health management service system and their interaction mechanisms, thereby laying a solid theoretical foundation for subsequent empirical research and pathway optimization.

1.5.2 Development of an evaluation index system for elderly health management service capabilities in primary medical and health care institutions

To establish a scientific evaluation index system tailored to China's national conditions, this research first conducted policy interpretation and current status surveys. Subsequently, it invited experts in health management, policy formulation, public health, and primary medical and health care institutions for expert consultation. Their insights on the key elements of elderly health management services were thoroughly incorporated to ensure the scientific rigor and validity of the framework. Through multiple rounds of expert consultation and feedback, the final evaluation framework for assessing the elderly health management service capabilities of primary medical and health care institutions was developed and refined.

1.5.3 Empirical research on the evaluation index system for elderly health management service capabilities in primary medical and health care institutions

Based on the established evaluation index system, a corresponding assessment questionnaire was developed. The questionnaire was distributed to staff at multiple primary institutions in Bao'an District, Shenzhen. Combined with in-depth interviews, this survey data was analyzed to evaluate the actual implementation of elderly health management services, identify shortcomings, and inform improvement strategies.

1.5.4 Policy recommendations for enhancing the capability of primary healthcare institutions to provide health management services for the elderly

Based on the empirical findings of this study, targeted recommendations and measures are proposed to enhance the health management service capability for the elderly in primary healthcare institutions. Policy recommendations and approaches for enhancing the elderly health management service capability of primary healthcare institutions in China are proposed from multiple dimensions, including resource optimization, professional capability enhancement, digital empowerment, multi-sector collaboration, and strengthened health education. By adopting a "demand identification-service optimization-quality improvement" approach, the service capability for elderly health management in primary healthcare institutions can be enhanced. Through concerted efforts and support across these areas, an evaluation index system for the elderly health management service capability of primary healthcare institutions is to be established, aiming to achieve comprehensive improvement in elderly health management services at the primary healthcare level.

Chapter 2: Literature Review

In contemporary China, socialism with Chinese characteristics has progressively entered a new era, and the steady economic growth has led to a significant improvement in people's living standards. As a result, the demand for medical services is no longer confined to accurate diagnosis and effective treatment; rather, higher expectations have been set through a better medical experience. Numerous countries worldwide have entered an era of population aging, with demographic shifts characterized by a rising proportion of individuals aged 60 and above - largely attributable to increasing life expectancy-now posing multifaceted challenges across economic, social, healthcare, and public policy domains in many nations (Ismail et al., 2021; Sander et al., 2022).

This research constructed a literature review through a systematic literature search and analysis method, with the specific process as follows: First, based on the research objectives, core databases such as PubMed, China National Knowledge Infrastructure (CNKI), and Wanfang Database are selected. PubMed was used to focus on international biomedical literature. A precise search was conducted using subject terms (e.g., "health management service capability," "the elderly," "primary medical and health care institutions," "evaluation index system") to identify high-quality literature published between 2020 and 2025. The latter focuses on Chinese policy documents (such as the National Basic Public Health Service Program) and CSSCI journals, covering domestic research through combined keywords such as “aging + evaluation index system.” Second, a multi-dimensional keyword strategy is adopted to classify and integrate terms into thematic categories (community elderly, health management), methodological categories (Delphi Method, SERVQUAL Model), and evaluative categories (evaluation index system). Synonyms are expanded (for example, “community health services” as an alternative to “primary care”), and temporal (prioritizing literature from the past 5 years) and quality screening criteria (e.g., highly cited, highly relevant) were established to eliminate irrelevant or low-quality literature. Ultimately, from over 300 studies, the evolution of policies, application of models, and progress in evaluation index systems are distilled, providing theoretical support for an integrated evaluation framework that consolidates theoretical models.

2.1 Population aging

The situation of population aging in China is currently severe. Data from the seventh national population census shows that the population aged 60 and above in China has reached 264 million, accounting for 18.7% of the total population. Among them, which the population aged 65 and above accounts for 13.5% of the total population (217 million) (Xing et al., 2023). By 2030, the proportion of China's population aged 65 and above is projected to surpass that of Japan, making China the most aged country in the world. Data indicate that by 2035, the population aged 60 and above is expected to increase to around 620 million, accounting for over 30% of the total population. Population aging and the resulting disabilities are set to place a heavy burden on both society and families (Yao, 2023; Yao et al., 2023).

Research by Wang et al. (2022) shows that the current characteristics of population aging in China are mainly reflected in the following aspects: the onset of population aging was relatively late, but the speed is fast and accelerating; the scale of the elderly population is large, and the country is rapidly entering an aging society; population aging is developing at an advanced and accelerated pace, with a clear trend of "aging before getting rich." Future population decline and aging are inevitably going to bring challenges that restrict economic development, reduce the scale of the economy, and affect the social security system and fiscal sustainability. These challenges also make family-based elderly care more difficult and weaken social vitality.

The physical health and self-care abilities of the elderly typically decline with increasing age, while the prevalence of chronic non-communicable diseases (hereinafter referred to as "chronic diseases") worsens on a yearly basis. Hypertension and diabetes are the most significant health issues faced by urban elderly individuals and have become the main manifestations of chronic diseases. It is also common for an elderly person to suffer from multiple chronic diseases simultaneously. Therefore, the healthy life expectancy of the elderly is not optimistic (Licher et al., 2025; Rizzuto et al., 2017). Chronic diseases not only affect the health of the elderly but also impose burdens on individuals, families, and society, and exert heavy pressure on the health care system (Guida & Carpentieri, 2021). The contradiction between the increasing health care needs of the elderly and the shortage of medical resources needs to be further addressed.

At the first meeting of the 20th Central Financial and Economic Affairs Commission, President Xi emphasized the need to accelerate the construction of a basic elderly care service system, cultivate new momentum for the silver economy, and improve a multi-level, multi-

pillar pension insurance system in order to implement the national strategy for addressing population aging and to achieve the goals ensuring basic living needs, providing opportunities for social engagement, and enabling a fulfilling life for the elderly. In the face of the increasingly severe aging problem in China, relevant departments have deeply implemented a proactive response strategy: to improve policies and systems for elderly care services; to continuously enhance the capability for basic elderly care services; and to strengthen the supervision of elderly care services.

2.1.1 Healthy aging

Healthy aging is an important strategy to cope with population aging. In 1987, the World Health Assembly first proposed the concept of healthy aging, the core of which is to start with the health and care of the elderly, extend their lifespan, shorten the period of living with illness, and improve the quality of life (Fallon & Karlawish, 2019). With the continuous development of socio-economy and the accelerated process of population aging, the World Health Organization and experts from various countries have been constantly innovating and improving the content of healthy aging. The health of the elderly is no longer confined to physical health, but also includes mental health and good social adaptation (Azzopardi-Muscat & Sørensen, 2019; Chesser et al., 2016; Foster & Walker, 2021). In addition, the World Health Organization has developed the “Global Strategy and Action Plan on Ageing and Health 2016-2020”, which mainly includes the following aspects: 1. All countries around the world should carry out activities to promote healthy aging; 2. Create and develop environments that are friendly to the elderly; 3. Adjust all health care systems to meet the needs of the elderly; 4. Establish reliable and appropriate long-term care systems (home, community, and institutional); 5. Improve monitoring, supervision, and research on the topic of healthy aging (Rudnicka et al., 2020). The concept of healthy aging has now gained widespread recognition, and an increasing number of scholars are beginning to conduct interdisciplinary research on the health issues of the elderly. Healthy aging is becoming an important development strategy (Alkhawaldeh et al., 2023).

2.1.2 Health management

Health management of the elderly is an important approach to healthy aging. In the 1990s, Professor Wu Cangping, a senior medical expert, introduced the theory of healthy aging in China and led the research and localization of healthy aging in China (Chen et al., 2012). In

2017, “Healthy China 2030” proposed to improve the health management of the elderly and promote healthy aging. Thirteen departments, including the National Health Planning Services, issued the “13th Five-Year Plan” for Healthy Aging” (National Health Commission of the People's Republic of China, 2017). Healthy aging involves a comprehensive and systematic intervention of all factors affecting health from a life-course perspective. It creates a good social support and environment for healthy adults, extends the healthy life expectancy of the elderly, maintains healthy functions, and improves the level of health. Research by Su et al. (Su et al., 2024) shows that the fundamental approach to healthy aging is the health management of the elderly.

The World Health Organization's active aging is a political strategy proposed to cope with global aging. It refers to improving the life expectancy and quality of life of individuals by optimizing the health, participation, and security of the elderly. The theory of active aging emphasizes the value and potential of the elderly for future social development, which is consistent with the guiding principle of China's aging cause that “the elderly should contribute to society,” which is the central link in the aging strategy during the primary stage of socialism (Gao et al., 2023; Wang et al., 2022). The report of the 20th National Congress of the Communist Party of China proposed “to actively respond to population aging and develop the elderly care cause and industry” in order to achieve healthy aging. In 2016, the national strategy mentioned in the “Healthy China 2030” Planning Outline was to “improve family doctor contract services, enhance the capability of primary health gatekeepers, and achieve health management throughout the life cycle” (Central Committee of the Communist Party of China, State Council, 2016). It explicitly raised the health and medical work policy of “people-centered health, primary-level focus, and innovation-driven reform” and “persisting in focusing on the primary level” (Yu, 2022). When considering China's basic national conditions, expanding the concept of healthy aging to encompass interventions on factors affecting health aligns more closely with the objectives and content of this research. Grounded in management-related theories and incorporating medical research methods, this research examines the health management services for the elderly provided by primary medical and health care institutions, and puts forward policy recommendations for development.

2.2 Primary medical and health care institutions and their development

As a foundational component of China's healthcare system, primary healthcare institutions not only undertake the essential functions of public health and basic medical services but also face

practical challenges in responding to the evolving societal health demands.

2.2.1 Primary medical and health care institutions

Primary medical and health care institutions are important vehicles for basic medical and health services and basic public health services in China. They are the cornerstone of the medical and health service system and the guardians of people's health (Huang & Xu, 2023). Township (sub-district) hospitals, community health service centers, and stations all fall under the category of primary medical and health care institutions. Their main responsibilities include providing basic public health services and basic medical services to the people within their service areas. They play a crucial role in the three-tier medical network (Liu, 2023; Long & Gan, 2022). Primary medical and health care institutions play a vital role in providing basic medical services and promoting health security.

Since the new round of health reform, primary health care institutions have played an important and fundamental role in providing primary health care to the public, with their functions shifting from providing health care to providing both primary health care and basic medical services. The focus of China's ongoing medical reform has been on “ensuring the basics, strengthening the grassroots, and establishing mechanisms,” with the core of “strengthening the grassroots” being the enhancement of the service capability of primary medical and health care institutions (Wang & Tao, 2023). Primary medical and health care institutions play a fundamental role in the disease prevention and control system and serve as the first line of defense in maintaining the health of residents. However, the effective functioning of these institutions cannot rely solely on the independent operation of individual entities; rather, it necessitates the integration of medical resources within the county domain to form a cohesive force. Only by addressing service weaknesses and strengthening foundational infrastructure can the overall level of regional medical and health services be elevated (Qin et al., 2021; Zhou & Qi, 2024).

Primary public health institutions an essential component of China's healthcare system. Strengthening primary public health management is not only a prerequisite for improving the response to public health emergencies but also a critical element in advancing the modernization of the national governance system and governance capability (Ou & Yang, 2023). Primary medical and health care institutions are the foundational units of China's medical and health system, shouldering the responsibilities of preventive health care, basic medical services, health education, and public health management for hundreds of millions of urban and rural residents. They play an important role in safeguarding the health of the population (Huang & Xu, 2023).

Improving and perfecting the primary medical and health care service system is key to achieving basic medical and health care in China and an important guarantee for Healthy China 2030 (Chen et al., 2023; Li et al., 2019). Meanwhile, Dai et al. (2013) with Deng and Lan (2022) found that strengthening the medical service capability of primary health care institutions helps to reduce medical costs. After the new health care reform, primary medical facilities have been vigorously developed, and financial subsidies for primary medical facilities at all levels have also increased.

Under the framework of the tiered diagnosis and treatment system, primary medical and health care institutions have differentiated functional positioning compared with secondary and tertiary medical institutions. High-level medical institutions mainly attract patients by relying on their professional technical advantages and brand effects, while primary institutions rely more on the stickiness of the doctor-patient relationship and humanistic care services to maintain patient compliance. This essential difference determines that the predictive models constructed based on patients from tertiary hospitals are difficult to directly apply to primary medical scenarios (Zhang et al., 2023). Patients' perceptions of the quality of services provided by primary medical and health care institutions have a significant positive impact on their intention to prioritize these institutions for medical treatment. The medical behavior of patients in primary health care is characterized by a preference for “efficiency first,” which contrasts sharply with the conclusions drawn from studies on large hospitals. Data shows that 72.5% of primary care patients prioritize “speed of problem resolution,” which is significantly higher than “cost expenditure” (53.2%) and “service attitude” (49.8%). The policy implication of this phenomenon is that optimizing primary medical services should focus on improving diagnostic and treatment efficiency (for example, by implementing pre-screening and triage systems to reduce waiting times) rather than simply replicating the operational models of large hospitals. This is particularly relevant in light of the current situation in China, where primary medical resources are relatively scarce and unevenly distributed geographically (Wu, 2022; Yang, 2021).

2.2.2 Health demands

Primary health care institutions now face expanding service tasks alongside increasingly diverse public health needs. This situation is in contradiction with the insufficient number and suboptimal service levels of primary health care professionals in some areas (Zeng et al., 2020). Through a survey of 16 primary medical and health care institutions in a county-level city in central Shandong province, Liu (2023) found out that these institutions also face the issue of needing to transform their service philosophy. They have not yet shifted from a disease-centered

to a health-centered approach, nor have they expanded from a narrow focus on treatment to encompass more comprehensive care, including prevention, health promotion, rehabilitation, health education, and psychological counseling.

Zhou et al. (2023) pointed out that the primary medical and health care institutions in Xiangzhou District of Zhuhai City mainly refer to health stations, clinics, and community centers. The level of infection control in various hospitals within the district is uneven. The Health Bureau of Xiangzhou District, Zhuhai City, has established an Infection Management Quality Control Center. With the continuous progress of the county-level hospital quality management center, the prevention level of primary health services at all levels is constantly improving. Hospitals have established a district-level hospital infection control system, integrated monitoring systems, and related reforms. This measure is of great significance. Shen et al. (2023) constructed an evaluation index system for the service capability of primary medical and health care institutions using literature analysis, expert consultation, and principal component analysis. They proposed optimizing the structure of resource allocation and establishing a consciousness of input-output; emphasizing the balanced development of primary medical services and public health; and formulating appropriate development strategies for primary medical and health care institutions with different development models.

Zhou et al. (2024) conducted an investigation on the current status of primary medical and health care institutions and home-based medical services in Sichuan Province. The research subjects were the person in charge of 62 primary medical and health care institutions in 7 cities. The research results show that there are certain differences in the actual work carried out by primary medical and health care institutions with different service orientations in different provinces. According to the research, the development of home-based medical services in Sichuan Province is thriving. However, there is significant room for improvement in the service modes, service hours, and workload provided by various medical institutions. Therefore, Zhou et al. (Zhou et al., 2024) suggest that medical institutions should, in light of their own circumstances, improve the quality of home-based medical services by establishing service standards and norms, focusing on the management of chronic diseases, and cultivating key talents in related fields. A survey conducted by Song et al. (Song et al., 2023) at the Dashong Community Health Service Center in Nanshan District, Shenzhen City, Guangdong Province, noted that primary medical and health care institutions focus on basic diagnosis and primary public health services. Their services differ from those of hospitals and public health facilities, partly due to insufficient investment in primary care and capability building by the health system. As a result, primary informatization lags far behind that of hospitals and public health

facilities. There is a lack of recording, archiving, and tracking of primary health care services. Assessment of health care quality still relies on telephone inquiries to a small number of residents, and there is a lack of data to support such assessments.

Chen et al. (2023), referencing data from Nanjing City in 2020 on the national “High-Quality Service at the Grassroots Level” platform, pointed out that primary medical and health care institutions in Nanjing should pay special attention to the number of health technicians, the number of general practitioners, the number of permanent residents, and the number of people with health records in order to improve service quality. Zhou and Yang (2022) found that the overall service efficiency of primary medical and health care institutions in Hubei Province is relatively low, showing weak growth between 2014 and 2019, but with significant technical efficiency losses. Zhou and Yang (2022) noted that the change in primary health service efficiency reflects a trend of intensive use of labor and capital factors, but the role of labor factors is not linear. The use of hospital beds and government financial subsidies have a positive impact on the efficiency of basic health services.

Based on data collected from community-level healthcare institutions in Hangzhou between 2019 and 2021, Zhang (2023) observed a consistent expansion of traditional Chinese medicine (TCM) services, marked by diversified service offerings, broader coverage, and significantly enhanced service environments and infrastructure. Nevertheless, the research identified persistent deficiencies in critical supporting elements - specifically categorized as "personnel, funding, and facilities" - manifested through shortages of specialized TCM practitioners, constrained financial investments, and inadequate equipment. To systematically elevate service quality and improve patient satisfaction, the research proposes a comprehensive reinforcement of the support system through targeted measures: strengthening professional workforce development, optimizing fiscal resource allocation, and upgrading equipment. The assessment of the achievements in the construction of primary medical and health care system during the “13th Five-Year Plan” period indicates that although the government has achieved phased results in hardware investment and service supply, key indicators such as the efficiency of resource allocation (number of health technicians per thousand population) and service output capability (average daily number of patients treated) still significantly lag behind the hospital system, reflecting that there is still room for improvement in the capability building of primary medical services. Comparative studies on the levels of resource allocation show that the imbalance in human resource allocation institutions the main bottleneck in the development of the primary medical and health care system; in terms of service output, the biggest development gap is in the number of admissions (Liu & Gao et al., 2022).

2.3 Health management models and development in China and overseas

Health management has progressively garnered significant scholarly attention globally, with a parallel growing focus on personal health. The increasing aging population, the rising burden of chronic diseases, and the spiraling costs of health care present significant challenges to health care systems in the world. Silberberg et al. (2019) defined population health as "the health outcomes of a group of individuals, including the distribution of such outcomes within the group." To address most of these challenges, there has been a deliberate shift towards population health management. Population health management is not just about those who are sick or hospitalized ("the patient"). It also involves ensuring that healthy individuals receive preventive services to avoid the onset of illness (Abraham et al., 2022).

Health management was first proposed in the United States, and countries such as the United Kingdom, Japan, and Germany have subsequently developed it gradually in accordance with their own situations. After nearly half a century of research and application, health management has been proven by many scholars to be an effective measure to improve the health status of residents (Furukawa et al., 2016; Hirsikangas et al., 2016; Kanavos et al., 2022; Vissers, 1998).

2.3.1 Health management models in developed countries

The market-oriented medical model in developed countries provides a variety of profit-driven services to meet different health care needs, which helps to emphasize social equity, improve the health of the elderly, and promote healthy aging. The strengths of health care management models combined with those of the government and the market integrate the fairness and efficiency of global health care models. In short, an effective national health management model can meet the needs of population health management, improve the health level of the population, control health care costs, thereby reducing the economic burden on the country and society, and creating a harmonious and comfortable environment.

Researchers have conducted extensive research on the utilization of medical services in different regions and among different populations (Karim et al., 2021; Oliveira et al., 2022). SoleimanvandiAzar et al. (2020) analyzed over 2,000 research studies on the utilization of medical services and found that factors such as gender, marital status, age, occupation, education level, place of residence, income level, and whether general insurance is purchased are correlated with the use of medical services.

Most studies mainly focused on vulnerable groups, such as the elderly, and explored the factors affecting the use of medical services from different perspectives. Gell et al. (2017) found in their research of the use of rehabilitation services among 7,487 elderly individuals in US communities that African Americans and the elderly who are uneducated have lower utilization rates of rehabilitation services. Social inequalities have led to disparities in service use. Shen (2021) found in a study of individuals aged 75 and above in Japan that the elderly with low incomes rarely use health consultation services, while the increased use of inpatient services may be due to the poorer health status of low-income elderly individuals. Moeller et al. (2000) explored the challenges facing the German health care industry, including budget constraints caused by economic recession and political factors, as well as the rising costs of medical care. Moeller et al. (2000) proposed the European Foundation for Quality Management (EFQM) Excellence Model as a potential quality management framework to address these issues. The study provides a detailed description of the pilot implementation phase of the EFQM Excellence Model in German health care organizations, as well as the various application methods recommended by EFQM. Through a detailed case study, the study documents how a German health care provider (offering social medicine, geriatrics, and geriatric care services) adopted this model. The research results highlight key advantages of the model, such as identifying organizational gaps and establishing a clear strategic direction for future comprehensive quality management programs.

Studies have shown that using mobile health applications is a major way to trigger the health empowerment process and shape health attitudes. Accurate assessment of the effectiveness of mobile health applications requires distinguishing between lifestyle behaviors and health management behaviors, and adopting cost-effective methods, because individuals facing issues such as chronic diseases, health emergencies, health crises, or health changes must consider their economic affordability and situational impact (Mano, 2021). Hopman et al. (2016) found out that in their study on health service utilization among patients with chronic diseases in the Netherlands that patients with multiple chronic conditions use more health services than those with only one chronic condition, but may receive less health-related medical management services. Garcia-Ramirez et al. (2020) conducted a survey of 23,694 individuals aged 60 and above and found that, in addition to inpatient services, the health care sector is also affected by economic status and type of health insurance. The research indicates that population health management in Belgium is still in its infancy. The seven interrelated barriers and suggestions for developing population health management in Belgium include: responsibilities of different levels of government, shared responsibility for population health, learning health systems,

payment models, data and knowledge infrastructure, partnerships, and community engagement (Steenkamer et al., 2023). This requires all stakeholders to have a sense of urgency to achieve the vision of health management for all. Gyasi et al. (2020) explored the relationship between social support and informal medical services among adults aged 50 and above in Ghana. The research results indicate that in low- and middle-income countries, structured and effective social support is crucial for achieving medical services. Health Management Models of different countries are shown in Table 2.1.

Table 2.1 Comparative analysis of healthcare man agement models across nations: system characteristics, implementation outcomes, and developmental challenges

Countries	Definition	Modes	Effect
USA	Community elderly (n=7,487)	Market-Driven Disparate Access •Private insurance-dominated reimbursement •Race/education-based service barriers •Decentralized rehabilitation networks	•African Americans: 37% lower rehab utilization •No high school diploma: 42% access reduction •Structural racism accounts for 58% of variance
Japan	Elderly ≥75 years	Universal Insurance with Socioeconomic Gaps •Mandatory national health insurance •Income-based copayment system •Preventive service underutilization	•42% lower health counseling utilization in low-income seniors •2.3x higher hospitalization rates correlate with poverty-related comorbidities
Germany	Healthcare providers	EFQM Excellence Framework •Quality management standardization •Pilot-tested in geriatric care institutions •Gap analysis methodology	•Identified 19.7% efficiency gaps in care coordination •Reduced redundant services by 28% post-implementation •TQM adoption increased by 35% in pilot sites
Netherlan -ds	Chronic disease patients	Multi-Morbidity Focused Model •GP-led care coordination •Disease-specific care pathways •Management service deficits	•Multi-morbid patients use 3.2x more acute care •Only 12% receive structured self-management training •67% care fragmentation reported
Belgium	National population	Emerging PHM Framework •Federal-regional governance split •7-pillar development roadmap •Data infrastructure gaps	•Only 29% municipalities have health databases •Stakeholder alignment <50% achieved •Requires €2.1B investment for full implementation
Ghana	Elderly ≥50 years	Community-Based Support Model •Family/faith organization networks	•Structured support improves access by 28% •62% rely on religious group assistance

Countries	Definition	Modes	Effect
		•Limited formal care	•Transport access increases follow-ups by 41%

2.3.2 Health management model of China

China has not yet established a standard health management model and a complete health management theoretical system. China already has the largest elderly population in the world, and with the “second baby boom generation” (those born between 1962 and 1975) beginning to retire in 2022, China's aging burden will further increase. There is complexity and inequality in the health of China's elderly population. Investing in healthy aging, from promoting health literacy education to improving access to health care, is a promising means of improving the well-being of the elderly and reducing health disparities among socioeconomic groups in China. Even as China's population ages, investment in healthy aging provides a way for Chinese seniors to play a meaningful and productive social role in society (Chen & Giles et al., 2022). Health management in China began in the late 1990s, lagging behind developed countries. However, with the rapid development of the socio-economy, research on the demand for health management has become an increasingly important topic. As the most populous developing country with an aging population and unbalanced urban-rural economic development, China cannot directly adopt the health management models of developed countries. It needs to consider the specific and actual needs of the people and the national conditions, learn from advanced concepts, and then form its own economically effective “Chinese-style health management model”.

In China, the government provides basic public health services to the public. Elderly health management, as a core project of the national basic public health services, is planned to implement periodic health interventions for people aged 65 and above. The project adopts a three-tier prevention system: primary prevention (health education and control of risk factors), secondary prevention (regular health screenings), and tertiary prevention (disease management). Through the establishment of a closed-loop management mechanism of “assessment-intervention-reassessment” (with a cycle rate of 83.6%), it achieves the organic combination of health status monitoring (including six major physiological indicators) and functional assessment of daily living (ADL scale score increased by 15.2%). The aim is to promptly identify health hazards and take corresponding measures to prevent more serious outcomes, reduce consumption due to disease treatment, and improve the level of living (Li & Lu, 2017).

Elderly health management refers to the provision of health management services to the elderly by primary health care institutions, large general hospitals, and health management

companies (Shen, 2021). Community health service institutions provide the most comprehensive and cost-effective medical security. This has been the main model for providing primary health services to residents in China since 2009, which includes health management for the elderly and explicitly proposes that basic health service institutions should conduct health management services for community elderly people aged 65 and above (Shen, 2021). The specific process of elderly health management is shown in Figure 2.1.

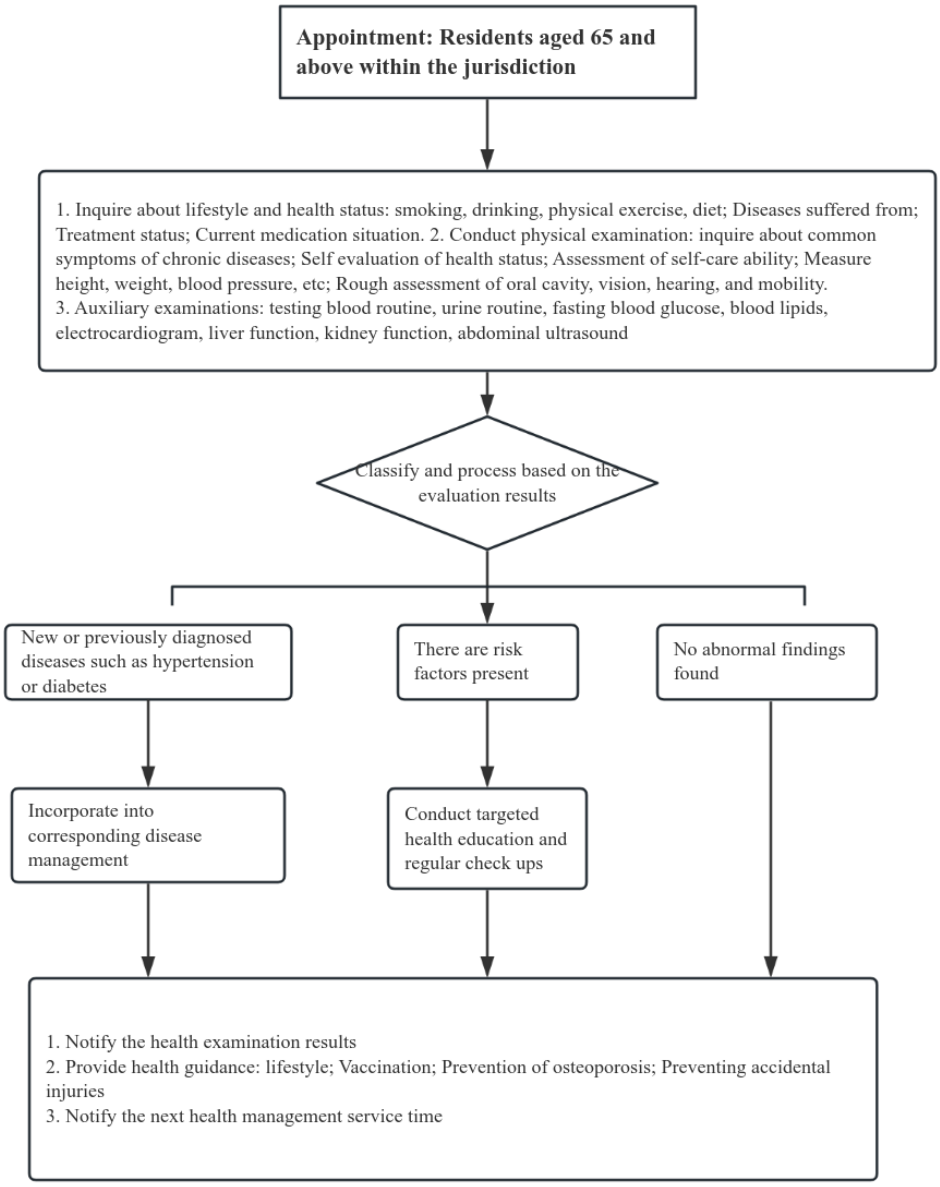


Figure 2.1 Flowchart of health management for the elderly

Source: National Health and Family Planning Commission (2017)

Currently, China does not have a unified health management model or evaluation standards for health management services, nor a complete theoretical system for health management. Current research mainly focuses on the specific needs of the elderly and patients with chronic diseases, with an emphasis on community health management. Health management is the most

direct, effective, comprehensive, and cost-effective form of health management, which is in line with China's specific national conditions and requires in-depth research.

2.3.3 Health management practice in China

Numerous scholarly studies have demonstrated that health management plays a pivotal role in advancing the process of healthy aging. In chronic disease management, lifestyle and behavior are the easiest to adjust and the most decisive in determining the effectiveness of interventions. Health management can change unhealthy lifestyles and behaviors through scientific and rational interventions. The “Healthy China 2030” Planning Outline in 2016 proposed that in daily work, it is necessary to increase the efforts of health guidance and comprehensive intervention for common diseases and chronic diseases among the elderly. This promotes the health management of the elderly in primary medical and health care institutions from multiple aspects and helps the country achieve healthy aging (Central Committee of the Communist Party of China, State Council, 2016). The Notice on Issuing the “13th Five-Year Plan” for Healthy Aging in 2017 (Department of Aging and Health, 2017) pointed out that health management is an important means for China to combat aging and the high incidence of chronic diseases. It can not only achieve healthy aging but also improve the health level of the elderly, reduce medical costs, and extend life expectancy (Jin et al., 2023). Zhang et al. (2017) also demonstrated through empirical research that the incidence of chronic diseases among the elderly in the community can be reduced through rational use of health management, or the process of chronic diseases can be slowed down, thereby improving the quality of life of the elderly. Against the backdrop of the need to pay a large number of pensions and the heavy burden of medical expenses on society, China has included elderly health care in the national primary public health service projects, invested a large amount of health resources from multiple aspects, and made primary health services the mainstay to achieve elderly health care services. Community-based health management, as the main place of residence for the vast majority of the elderly, serves as an effective measure to prevent or alleviate diseases, improve symptoms, and promote rehabilitation and represents an inevitable choice to reduce the burden on families, relieve stress, and provide social and economic assistance.

Based on international experience, Bao (2013) proposed the “4CH8” health management model, which includes four stages (4C) of filing, risk assessment, intervention, and effect evaluation. The “4CH8” health management model establishes health homes (4H) for the elderly, women, children, and patients with chronic diseases; the service includes eight modules, including weight monitoring, bone density testing, and psychological intervention. The

application of the model in health management of key populations in the community has shown to improve diagnostic management and satisfaction among these groups, and has demonstrated good applicability and effectiveness (Song et al., 2014). The “Medical Social Worker + Family Doctor” health management model in Haishu District, Ningbo, has been proven to improve the quality of health management services and resident satisfaction through community health management, service provision, resource connection, policy adjustment and promotion, and practical implementation (Ma, 2019).

Chinese residents have some distrust in primary health care institutions, due to the limited resources, low service levels, and imbalanced service capabilities of some institutions. Large general hospitals have advanced and complete medical equipment and testing instruments, but mainly provide physical examination services for consumer groups such as enterprises and employees. Therefore, primary medical and health care institutions and large general hospitals can explore complementary models to provide residents with more comprehensive and diverse health management. Wang et al. (2017) found through a baseline survey of 1,196 residents aged 40 and above in a community in Shijiazhuang that the high-risk stroke population that implemented the “hospital-community collaborative health management model” had a better understanding of stroke prevention and healthier lifestyles than the general population. Reachers (Li et al., 2022; Lin et al., 2022) conducted surveys on health management and health education for patients with hypertension and diabetes in the implementation of basic public health service projects in Inner Mongolia. The standardized health management rates for hypertension and diabetes have significantly increased, and blood pressure and blood glucose control rates have also improved. These studies provide the most comprehensive evidence to date for the upward trend in health management and health education of chronic diseases such as hypertension and diabetes in Inner Mongolia, China.

In addition, there are also researchers who provide a variety of content services, such as Liu et al. (2017) incorporated the health management of elderly individuals with mild cognitive impairment into community health management; Wang et al. (2019) drew on the experience of Changning District in Shanghai to construct a demand-oriented traditional Chinese medicine community health management model; Li et al. (2016) suggested using modern information technology to establish an “Internet + Community” health management model to provide personalized professional health care services.

The health management work in China mainly focuses on the elderly and patients with chronic diseases. Under the severe situation of population aging, researchers have explored various factors affecting the utilization of health services in health management work,

addressed existing barriers, and provided more rational health management services. Chen et al. (2018) found in their survey of the disease prevalence and health service utilization among urban elderly individuals in China that the elderly and those with lower socioeconomic status used more clinic (72.7%) and hospital services (77.3%). Empirical research on the current status of health management among elderly individuals aged 60 and above in the southwest region of China, using a combination of quantitative and qualitative methods, found that 85% of respondents were aware of and used health management, and 94% of the elderly were satisfied. However, there are still issues such as poor service provider capability, low health literacy among the elderly, insufficient funding, and lack of interdepartmental cooperation (2020). In a study by Yang (2021), 98 patients with hyperlipidemia from Jeju City Hospital were selected for education based on the Health Belief Model. According to comparative research, health education can enhance patients' beliefs in health and improve their capabilities. Huang (2015) found in a survey of single elderly individuals in the urban area of Fuzhou that they need health management, but the utilization rate is very low, mainly due to the lack of social support leading to more severe psychological problems. Zhu et al. (2017) conducted a personal health intervention experiment for the elderly in Haikou City. That is, based on the health check-up results, the main health risks of the subjects were assessed, and reasonable and scientific health guidance was provided from aspects such as diet, exercise, and psychology, with continuous adjustment and monitoring were carried out without interruption. Since the implementation of health management, the incidence of chronic diseases among the elderly can be reduced and medical costs can be lowered. Therefore, strengthening health management for the elderly who are not ill can slow down or delay the onset of diseases. Li et al. (2016), in their research in Chongqing, showed that the elderly can only assess the effectiveness of community health services once a year. Some elderly people who did not participate in health check-ups as planned challenge the results assessment of the existing health model. Niu et al. (2015) indicated by a survey of the health service needs and utilization of 853 elderly individuals in Zhejiang Province that the health service needs and utilization of the elderly are relatively equal, but the service information is low (22.2%) and the satisfaction is low (64.45%). It is suggested that medical and health institutions should increase their efforts in health knowledge education for the elderly.

2.3.4 Health management in primary medical and health care institutions

Health management of residents in primary medical and health care institutions is an important means to achieve the Healthy China strategy. Health management in primary medical and health

care institutions refers to the health management provided by primary medical and health care institutions to individuals and families. It includes comprehensive testing, analysis and assessment, health consultation, guidance, and other services. It aims to prevent and reduce diseases through various means, effectively implement three-tier prevention, and improve the health level and quality of life of the people (Zhou et al., 2018). The health management of prioritized focused groups and health education activities for all residents are the main contents of health management services in Chinese primary medical and health care institutions. In addition, in places where the family doctor contract system has been implemented, the service targets have been expanded from prioritized focused groups to include those who have completed the family doctor contract.

Primary medical and health care services, as the foundational support of China's public health system, encompass a diversified range of modules, including primary medical services, disease prevention and control, health education and promotion, application of appropriate traditional Chinese medicine techniques, family planning guidance, and health management of key populations. Primary medical services are delivered through general practice, standardized management of chronic diseases (such as the closed-loop management of hypertension and diabetes), and the construction of pre-hospital emergency networks, thereby establishing a 15-minute health service circle that covers common and frequently occurring diseases. Disease prevention and control rely on interventions such as vaccination, grid-based monitoring of key infectious diseases (e.g., the three-in-one management model for tuberculosis), and occupational health protection, significantly enhancing the community's comprehensive disease prevention and control capabilities. Health management services, as an important advanced module of this system, have achieved a paradigm shift from passive medical treatment to active health management through the establishment of a dynamic updating mechanism for residents' electronic health records, the conduct of precise health risk assessments (covering multiple dimensions such as nutritional diet, exercise intervention, and psychological adjustment), and the formulation of personalized health intervention plans (e.g., the three-physician co-management model for patients with metabolic syndrome).

The health management module promotes the shift from treatment to proactive care through the following means: dynamic electronic health records; multidimensional assessments (nutrition, exercise, psychology); and personalized plans (the “three-tier specialist collaboration” for metabolic syndrome). Under the “Healthy China 2030” goal, primary healthcare institutions have been strengthened through a tiered medical system: expanding contracted family doctor services, promoting the use of smart health devices and integrated health information systems,

and incorporating health and preventive service packages. These measures form a lifelong management chain that enhances health literacy, controls chronic disease incidence, and extends life expectancy.

People health management is a crucial component of the Healthy China strategy. Recently, the trends of population aging and the rising prevalence of diseases among younger individuals have become increasingly apparent. Various health issues have emerged at different life stages, presenting significant challenges for the reform of China's medical system in this new era. Primary medical and health care institutions serve as the principal providers of primary medical services. These institutions, which offer essential health and medical services, benefit from their proximity to residents and maintain a stable service radius; thus, they have established themselves as the "gatekeepers" of public health management and are often regarded as the first choice for primary healthcare services. However, there is an imbalance in the current allocation of public service resources. The inadequate service capability of primary medical and health care institutions, coupled with uneven development across regions, starkly contrasts with the continuously growing healthcare needs of the population (Shen, 2021).

2.4 The connotation and demand of health management for the elderly in China

In addressing the health challenges brought by societal aging, elderly health management plays a crucial role. This requires not only establishing a systematic management framework based on health data but also addressing the complex health needs of the elderly, which arise from declining physical function, the coexistence of multiple chronic diseases, and the intertwining demands of mental well-being.

2.4.1 The concept and connotation of health management for the elderly

Health management for the elderly refers to a specialized health intervention tailored to the elderly population, aimed at managing and optimizing their "holistic health". Specifically, it institutions a continuous, comprehensive, and traceable health management approach for individuals and families, with its implementation grounded in health data. Beyond standard medical examinations, healthcare professionals conduct assessments of the elderly’s health status by evaluating their lifestyle factors. Subsequently, personalized health strategies are formulated and implemented based on the findings of these assessments (Tan et al., 2022).

The connotation of health management for the elderly mainly covers the following six aspects: (1) Elderly Cognitive Impairment: This refers to... For instance, in 2013, the International Association of Nutrition and Aging (IANA) defined elderly cognitive impairment as a cognitive disorder caused by the decline of physical functions, which does not include Alzheimer's disease and other types of dementia accompanied by cognitive impairments (Dartigues & Amieva, 2014). (2) Brain health, which has become a growing concern as the elderly population increases. The number of elderly individuals suffering from stroke is also on the rise. Elderly stroke patients often experience long-term sequelae such as disability dependence, emotional deficits, and cognitive impairments (Jiang et al., 2019). (3) Exercise: Epidemiological data shows that the prevalence of sarcopenia in the population aged 65 years and above ranges from 10% to 20%, leading to a 24.6% increase in direct medical costs. As an intervention with the optimal cost-effectiveness ratio, exercise can bring the following benefits to the elderly: 1) Increasing muscle strength by 28.3%; 2) Reducing the risk of falls by 41%; 3) Improving the Activities of Daily Living (ADL) score by 19.7%. (4) Diet and Nutrition: Dietary habits in the elderly population are closely related to digestive, endocrine, and metabolic diseases throughout their life process. (5) Mental health, changes in living environment, social relationships, and other factors have significant impacts on the psychology of the elderly. In severe cases, they can lead to adverse psychological problems such as depression and anxiety. Mental health not only affects the quality of life but also directly impacts physical health. For example, depression can severely affect the recovery from other chronic diseases, and individuals with depression are more likely to develop chronic conditions such as cardiovascular and cerebrovascular diseases and dementia. (6) Social participation, which is not only an important way to meet the objective needs of the aging population but also a crucial means to realize personal value and achieve spiritual comfort.

2.4.2 Health issues and demands of the elderly

As the global population ages, several major factors is challenged by the health of the elderly: physiological aging, chronic diseases, and mental health. Aging is inevitable as one grows older, and it is essential to distinguish between aging and disease. The multisystem physiological decline that occur during the aging process involve multiple systems and tissues of the human body.

It is important to notice that the rate and extent of physiological decline are correlated with age. A key indicator of disease is the manifestation of symptoms that exceed the expected physiological decline for a given age, significantly impair daily living activities, or cause an

unexplained and rapid deterioration in physical condition. Chronic diseases are the primary health issues among the elderly and have become the main causes of death and functional impairment in older adults worldwide. The top three most prevalent diseases are cardiovascular diseases, stroke, and cancer. Other common health problems include respiratory diseases and metabolic abnormalities. Mental health challenges in the elderly are multifaceted, encompassing psychological states such as a sense of loss, loneliness, nostalgia, perceived uselessness, and heightened sensitivity/suspiciousness. In more severe cases, these can manifest as clinical conditions including severe anxiety, depression, insomnia, and other psychiatric symptoms.

Currently, the strategic plan for addressing the health needs of the elderly primarily focuses on three key dimensions:

(1)Promoting Healthy Ageing: This involves promoting healthy ageing through maintaining a positive mindset, engaging in moderate physical activity, participating in social interactions, ensuring sufficient sleep, attending regular health examinations, practicing rational drug use, and adhering to a nutritious diet.

(2)Chronic Disease Prevention and Management: Efforts are concentrated on enhancing the early detection, intervention, and categorized guidance for chronic conditions among the elderly. Key initiatives encompass a range of interventions: from oral health campaigns and dietary guidance to dementia prevention and management. Additionally, there is a critical need to expand the coverage and quality of mental health services for the elderly and their families, including those with disabilities. Furthermore, increasing the availability of home-based healthcare-such as the provision of home-based hospital beds and home visits by clinical teams from primary care institutions-plays a vital role in delivering effective care to this population.

(3)Strengthening Community-Based Psychosocial Support: This strategy is twofold: it encourages the transformation of community facilities...into multi-functional spaces..., while simultaneously focusing on capability building through the training of core personnel and the development of innovative, senior-friendly activities. This integrated approach aims to enhance program quality and, consequently, increase participation rates among the elderly.

2.5 Theoretical basis

This study constructs a theoretical analysis framework for improving the elderly health management service capability of primary healthcare institutions, based on the Service Quality Gap Theory, Total Quality Management Theory, and Dynamic Capability Theory.

2.5.1 SERVQUAL Model

In 1985, the Service Quality Gap Theory was proposed by American marketing scholars A. Parasuraman, Valarie A. Zeithaml, and Leonard L. Berry (referred to as the PZB Group for short), and is also known as the "5GAP Model" (Parasuraman et al., 1988). This theory considers that service quality is the discrepancy between customer expectations and their perceptions of the service received. When this gap is zero, it signifies that the service quality has reached the ideal state of customer satisfaction. According to the theory, there are five distinct gaps in the service delivery process. (1) The Knowledge Gap: This occurs when management does not fully understand customers' expectations. Contributing factors include inaccurate market research and demand analysis, misinterpretation of customer expectations, a lack of proper needs assessment, and information distortion caused by an excessive number of organizational hierarchies. (2) The Standards Gap: This gap arises from the failure to select appropriate service designs and standards. It can be caused by flawed planning, disorganized planning management, the absence of clear organizational goals, and a lack of top management support for service quality initiatives. (3) The Delivery Gap: This gap emerges when services are not delivered in accordance with established standards. Causes include overly complex or rigid standards, employee disagreement with the standards, a misalignment between standards and corporate culture, inefficient service production management, inadequate internal marketing, and technological or systems limitations that hinder performance. (4) The Communication Gap: This refers to a discrepancy between service delivery and external promises made to customers. It results from a lack of integration between marketing communications and service production, poor coordination between traditional marketing and operations, an inability to deliver on standards promised in marketing communications, and instances of overpromising or exaggerated claims. (5) The Service Gap: This represents the core discrepancy between customers' expectations and their perceptions of the actual service received. It is defined as the cumulative result of the preceding four gaps and is considered the most critical outcome.

Parasuraman et al. (1988) developed the Gap Analysis Model, a framework centered on diagnosing the discrepancies (or gaps) between customers' service expectations and their actual perceptions. This model is operationalized through the identification of five specific gaps in the service delivery process. In its initial conceptualization, the model was built upon ten key determinants of service quality. Its initial theoretical framework identified ten key dimensions: reliability, responsiveness, competence, accessibility, courtesy, communication, credibility,

security, understanding the customer, and tangible evidence. To refine and operationalize this model, the PZB team subsequently introduced the SERVQUAL scale in 1988. This instrument concretely measures service quality from the customer's perspective by quantifying the gaps between their expectations and perceptions across defined dimensions. The original ten dimensions were consolidated into five key factors: tangibles, reliability, responsiveness, assurance, and empathy. Each dimension is defined as follows:

Tangibles refer to the physical facilities, equipment, and appearance of personnel involved in the service process. Reliability denotes the ability to perform the promised service accurately, consistently, and dependably.Responsivenessis the willingness to help customers and provide prompt service. Assurance is the knowledge and courtesy of employees and their ability to convey trust and confidence. Empathy involves caring, individualized attention provided to customers to meet their specific needs (Zhang, 2023).

The application of the SERVQUAL Model in the health care field is relatively mature. International researchers have applied the SERVQUAL Model to assess the actual needs of the public for the health care industry and their satisfaction with the services provided (Gilavand & Torabipour, 2022; Jonkisz et al., 2021). Sharifi et al. (2021) used the SERVQUAL and HEALTHQUAL models to collect evaluations of service quality from 200 health service users referred to four health centers in Mashhad, Iran, between January and June 2019. The results showed a negative gap between the expectations and perceptions of service users. These findings can help health managers and policymakers plan effective interventions to improve the services provided, particularly emphasizing dimensions with larger gaps. Greek et al. (2021) conducted a cross-sectional survey using the SERVQUAL questionnaire to investigate patients' perceptions and expectations of health service quality among inpatients and outpatients at five public general hospitals in Attica. The research results indicated that hospital managers and health care professionals should be interested in patients' expectations and then seek ways and means to fulfill these expectations. Open communication with patients, personalized attention, responsiveness to patient requests, courteous behavior, a trusting atmosphere throughout the hospital, and better physical facilities are pivotal determinants in determining patients' judgments of quality.

A survey utilizing the SERVQUAL Model was conducted among 528 dental and nursing students from public and private sectors in Egypt and Saudi Arabia to assess their perceptions of educational service quality. The research results showed that students' perceptions of educational service quality were above average. The specific field of study was the most influential predictor on the quality of educational services. Additionally, the educated periods,

educational sector, and country also exerted a significant influence on the quality of educational services (Aboubakr & Bayoumy, 2022). In Brazil, many public hospitals face high demand issues due to overall resource shortages. Researchers proposed a hybrid method combining the Quality Function Deployment tool, fuzzy logic, and SERVQUAL as a decision support tool for quality planning at the Onofre Lopes Surgical Center of the Hospital Universitário Onofre Lopes. The results indicated that the proposed method could optimize the decision-making process submitted by hospital administrators and improve the operational efficiency of the surgical center.

In the Philippines, the National Health Insurance is the health service provider for citizens. Therefore, researchers conducted a satisfaction survey among National Health Insurance members. The research employed the 10 latent variables of the SERVQUAL comprehensive service quality and the Expectation Confirmation Theory, analyzing data from 500 respondents. Analysis using structural equation modeling revealed that reliability, responsiveness, socioeconomic factors, expectations, perceived performance, belief confirmation, and member satisfaction are significant factors affecting the satisfaction of National Health Insurance members (Ong et al., 2022).

Su et al. (2021) conducted research on medical service quality using the SERVQUAL Model in China. The core of the model is the assessment of “service quality gaps,” positing that service quality depends on the degree of discrepancy between residents' satisfaction with the actual service and their expectations (Kalaja & Krasniqi, 2022). For instance, Li (2024) investigated the service quality of community health centers in Zhejiang Province from a demand-side perspective, applying the SERVQUAL Model within the context of county-level medical communities. Li's findings revealed a discernible misalignment between service quality and resident expectations. Primary medical and health service institutions should pay attention to the service needs of residents who are younger, have higher incomes, and have been suffering from chronic diseases for a longer period. In their analysis of the development pathways for family doctor contract services, Xiong et al. (2024) emphasize that establishing a scientific quality evaluation system is crucial for shifting the focus from "coverage expansion" to "quality improvement." Although their study does not directly develop a measurement instrument, it explicitly highlights the importance of introducing standardized assessment tools, such as the SERVQUAL Model, for measuring perceived service quality, identifying gaps between supply and demand, and providing a theoretical foundation for optimizing contract service policies. Ren et al. (2021) conducted a questionnaire survey of 501 patients from two tertiary Class-A hospitals and five community health service centers in Hangzhou, based on the SERVQUAL

theory from the perspective of patient experience to understand the use and satisfaction of intelligent medical services in public hospitals in Hangzhou. The results indicate that patients in Hangzhou have a generally positive evaluation of intelligent medical services. The study proposed several recommendations for enhancement, focusing on data security, system optimization, platform standardization, and the deepening of technology application scenarios.

Some researchers, integrating the SERVQUAL Model, constructed a comprehensive healthcare service quality evaluation system comprising five dimensions-reliability, timeliness, safety, supervision, and empathy-and 15 secondary indicators. They collected and analyzed questionnaire data from Baotou City (Inner Mongolia Autonomous Region), Xi'an City (Shaanxi Province), Yichang City (Hubei Province), and Shaoxing City (Zhejiang Province). The analysis of elderly satisfaction revealed notable disparities in the comprehensive healthcare service quality between public and private nursing homes: notably, the scores differed significantly in the dimensions of normativity and empathy, public nursing homes scored significantly higher reliability, timeliness, and safety whereas both types scored comparatively low. These findings offer a multidimensional reference for identifying problems in the integrated healthcare services across different dimensions and contribute to the improvement of high-quality integrated healthcare services in elderly care institutions (Zhang et al., 2024). In a related study, Bao et al. (2021) investigated inpatient service quality using a revised SERVQUAL scale. Their findings revealed a significant gap between the expected service quality of tertiary general hospitals and patients' actual perceptions. The study recommended a strategic shift in management focus towards more patient-centered approaches.

Wu et al. (2024) found that patients receiving pre-anesthesia oral examinations perceived lower service quality in reliability, responsiveness, and empathy compared to the control group, with the first two dimensions directly influencing satisfaction. This underscores that, beyond tangibles and assurance, service consistency and promptness are critical to patient experience. Separately, Cai et al. (2025) observed that longer hospital stays correlated with decreased satisfaction in tangibles and reliability, though not in responsiveness or overall satisfaction. This implies that the perceived decline primarily concerns physical facilities and service dependability, with cost-related perceptions potentially intensifying during extended hospitalizations.Using the SERVQUAL Model, Wang et al. (2021) identified deficits across all five dimensions in Traditional Chinese Medicine (TCM) services within primary healthcare institutions in Gansu Province, signaling an overall need for quality improvement. The study further highlighted cost reasonableness as a particular concern, given the distinctive nature of TCM services.

In summary, diverse healthcare sectors exhibit distinct service quality challenges across SERVQUAL dimensions. Against the backdrop of accelerating population aging, the role of elderly health management is gaining prominence. A scientifically grounded evaluation of service quality, coupled with strategic enhancements to service capability, is essential to meet the personalized, multi-level, and dynamic demands of older adults-a crucial step toward mitigating the challenges of an aging society and improving seniors quality of life. Informed by the SERVQUAL framework and acknowledging the salient role of economic factors in primary care, this study introduces cost reasonableness as a sixth dimension alongside the five original ones. This adaptation is consistent with prior research emphasizing the influence of cost perceptions on patient satisfaction (Cai et al., 2025; Wang et al., 2021; Wu et al., 2024), in addition to tangibles, reliability, responsiveness, assurance, and empathy. For a detailed breakdown, see Table 2.2.

Table 2.2 SERVQUAL Model scale

Dimension	Index
Tangibles	1. There are modern service facilities available
	2. Attractive service facilities
	3. Employees are dressed neatly
	4. Facilities match the services provided
Reliability	5. The promised things can be fulfilled in a timely manner
	6. When customers encounter difficulties, they can show concern and provide assistance
	7. The organization itself is reliable
	8. Accurately provide the adopted services
	9. Accurately record relevant services
Responsiveness	10. Clearly inform the start and end time of the service and the time of each link
	11. Provide services within a limited time frame
	12. Service personnel always actively help customers
	13. Timely respond to each customer's request
Guaranteed	14. Service personnel are trustworthy
	During the process of receiving services, customers feel at ease
	16. Service personnel are polite
	17. Service personnel can receive organizational support and provide better services
Empathy	18. Provide personalized services based on customer needs
	19. Understand the customer's special requirements and pay attention to them20. Fully understand the customer's needs
	21. Prioritize the interests of customers
	22. Meet all customer service needs during working hours
Reasonableness of Costs	23. The service fees charged to customers are reasonable

2.5.2 Total Quality Management

Total Quality Management (TQM) was first proposed by Armand V. Feigenbaum in his 1961

work Total Quality Control. It refers to a comprehensive set of management philosophies, systems, and methodologies that engage all employees, apply diverse scientific approaches to improve organizational management and services, and strive to achieve customer satisfaction through high-quality, continuously improved products and services. TQM is characterized by several distinct principles. Firstly, it emphasizes a customer-centric approach: evaluating management performance from the customer's perspective, pursuing customer satisfaction, and establishing long-term interactive relationships with customers. Secondly, it implements comprehensive management, which involves full staff participation and collaboration, end-to-end process control, and the adoption of cross-functional process management to reduce waste, shorten cycles, and integrate cost, time, and quality objectives. Thirdly, it treats standard operating procedures (SOPs) as subjects of continuous improvement and adaptation. Notably, "customer-oriented quality management activities that involve full scope, full process, and full staff participation" represents the most distinctive feature that differentiates TQM from other quality management paradigms.

Within the scope of public management, TQM focuses on strategies, visions, and operations. Its purview extends to organizations, society, and communities, society, and communities, with optimal objective standards as the evaluation criteria. It serves as an integrated system, an integrated system, a method for quality improvement, and a fact-based decision-making model.

The fundamental method of TQM is the Deming Cycle (PDCA Cycle), which comprises four sequential steps for continuous improvement and learning: Plan, Do, Check, and Act. This theory began to be applied in the field of corporate management in the 1960s, leading to significant innovations in the industrial sector. During the 1980s and 1990s, with the rise of the New Public Management movement, it was introduced into the field of government management, giving rise to the concept of Government Total Quality Management (GTQM). The implementation of TQM requires a comprehensive set of procedures. The implementation typically encompasses seven core steps: securing leadership and support from senior management, strategic planning, maintaining customer orientation, conducting evaluation and analysis, providing employee training, implementing a system of rewards and penalties, and empowering organizational members and promoting teamwork, along with quality assurance. Among these steps, the active participation of senior management is of paramount importance, while customer orientation institutions the key focus of management.

In the field of health and healthcare, the theory of TQM has been extensively applied. With the continuous rise in medical costs and the unmet needs of patients (Short, 2010), hospitals pioneered reforms and proactively introduced TQM. They have established TQM systems,

which are regarded as key initiatives to enhance medical quality and safety. Examples of such efforts include organizing competitions for outstanding cases of TQM-based continuous improvement, providing training on the application of refined management tools such as PDSA (Plan-Do-Study-Act), emphasizing the improvement of medical quality management and efficiency, and establishing a comprehensive TQM and control system characterized by "full-staff participation, full-department control, and coverage of the entire process of clinical diagnosis and treatment services". These initiatives have collectively enhanced patient satisfaction. In the field of hospital management, the core concepts of TQM emphasize top management leadership, with a focus on service processes and patient concerns, and their application in clinical settings has demonstrated efficacy (Al-Shdaifat, 2015). Additionally, the government-led elderly health management program under basic public health services has adopted TQM principles and used data-driven methods to evaluate intervention effects. The results indicate that TQM can significantly lead to significant improvements in physical health indicators.

The application of TQM in elderly health management services aims to enhance care quality, optimize resource utilization, and improve the health outcomes of the elderly population. Specifically, it has significantly elevated service quality and health outcomes by systematically improving care processes, strengthening interdisciplinary collaboration, and focusing on client needs. Despite facing structural and cultural challenges, the successful implementation of TQM in China’s Primary Public Health Service programs has demonstrated that TQM can serve as an effective strategy to address the challenges of population aging. It is crucial to focus on leveraging information technology tools through TQM processes (Sony et al., 2022), taking quality as the core to enhance the capability of primary healthcare institutions in providing elderly health management services. This approach is intended to maximize the potential of TQM in improving the effectiveness of elderly health management services and establish a scientific evaluation index system.

Based on the TQM theory, this research is implemented with the full participation of stakeholders in indicator design and conducting interviews with personnel from health administrative departments, medical and nursing staff, as well as research subjects. With service recipients at the core, an evaluation indicator system focusing on the demand side was developed based on the survey results of the elderly population. Furthermore, the evaluation indicators for the elderly health management service capabilities of primary healthcare institutions were continuously refined through expert consultation.

2.5.3 Dynamic Capabilities Theory

The Dynamic Capabilities Theory (DCT) aims to explore how enterprises integrate and reconfigure their own resource bases to gain competitive advantages in a dynamically changing environment. Originating from research on organizational routines, core competencies, organizational rigidity, and combinative capabilities, this theory extends the application of the Resource-Based View (RBV) to the dynamic market environment.

In the 1990s, Teece et al. (1997) proposed the concept of dynamic capabilities, defining it as an enterprise's capability to integrate, build, and reconfigure internal and external competencies in response to a rapidly changing environment. Research by Teece et al. (1997) proposed" a content framework for dynamic capabilities, which includes three dimensions: processes (the ways enterprises coordinate and combine resources), positions (the combination of enterprises' non-tradable knowledge assets and complementary assets), and paths (the evolutionary paths adopted or inherited by enterprises). Rooted in the firm's specific resource endowment and historical paths, dynamic capabilities are inherently complex and difficult to imitate, and thus form the basis for building and sustaining competitive advantage in turbulent markets.

Then, Eisenhardt and Martin (2000) redefined the concept of dynamic capabilities, defining them as a set of specific, identifiable specific and identifiable organizational processes. They argued that dynamic capabilities exhibit distinct manifestations in moderately dynamic markets versus high-velocity dynamic markets: in moderately dynamic markets, they resemble traditional organizational routines; in high-velocity dynamic markets, however, they are organizational processes characterized by simplicity, high empiricism, instability, and unpredictable outcomes. From the perspective of organizational routines, Zollo and Winter (2002) defined dynamic capabilities as a stable pattern of collective activities acquired through learning, through which organizations systematically generate and modify their operational routines to enhance efficiency. Winter (2003) further distinguished between dynamic capabilities and ordinary capabilities, noting that while ordinary capabilities sustain an enterprise in the short term, whereas dynamic capabilities pertain to the capability to expand, modify, or create ordinary capabilities.

In 2007, Teece (2007) further decomposed dynamic capabilities into three dimensions: sensing opportunities and threats, seizing opportunities, and reconfiguring resources to sustain competitive advantages. Scholars such as Zahra et al. (2006) emphasized the role of managerial decision-making, defining dynamic capabilities as the ability of key decision-makers to

reconfigure an enterprise's resources and routines in anticipated and deemed appropriate ways.

In the field of health care and public health, the application of the Dynamic Capabilities Theory (DCT) is primarily reflected in the development and optimization of health assessment and management processes for the elderly, enabling adaptation to" their evolving health needs and changing environmental conditions (Pesqueira et al., 2025). Given the continuous changes in the health status of the elderly and the medical service environment, the Dynamic Capabilities Theory emphasizes that organizations must possess the capabilities to sense opportunities and threats, seize opportunities, and respond to threats, an aspect that is particularly crucial in elderly health management services (Randhawa et al., 2022). As outlined by researchers (Li & Wang et al., 2023; Liu & Zhang et al., 2023; Wang & Wang et al., 2022) the four sub-capabilities emphasized by the Dynamic Capabilities Theory (DCT) can be extended to the context of elderly health management service capabilities, which are manifested in the following ways: (1) Sensing capability: The ability to identify the health needs of the elderly and changes in the external environment. Through continuous health monitoring and assessment, changes in the health status of the elderly can be detected in a timely manner; (2) Learning capability: The ability to continuously optimize health intervention plans by analyzing the health data of the elderly. Machine learning algorithms are used to mine massive volumes of assessment data, identify potential health risk patterns, and predict disease progression trends; (3) Integrating capability: The ability to integrate health data and resources from diverse sources to establish a unified health management system. It integrates medical Hospital Information Systems (HIS) with health records, thereby establishing a closed-loop management process that covers screening, intervention, and follow-up; (4) Coordinating capability: The ability to coordinate multidisciplinary teams to provide comprehensive health management services. It supports the remote collaboration of multidisciplinary experts such as physicians, dietitians, and rehabilitation specialists, and generates real-time comprehensive assessment reports through standardized scales and intelligent algorithms.

Applied to elderly health management, the Dynamic Capabilities Theory demonstrates a capability to swiftly adapt to environmental changes, integrate resources, restructure operations, and leverage multi-stakeholder collaboration for systemic improvement. From this perspective, the dynamic adjustment of evaluation indicators and the development of capability enhancement pathways can enable more precise and personalized health services for the elderly, thereby offering society an effective new model for health management.

2.6 Theoretical framework

This study integrates Service Quality Gap Theory, TQM Theory, and Dynamic Capabilities Theory to construct a comprehensive theoretical framework for enhancing elderly health management service capabilities in primary healthcare institutions.

Guided by a demand-oriented approach and grounded in the Service Quality Gap Theory, this research employs the SERVQUAL Model to assess the current state of services across six dimensions: tangibles, reliability, responsiveness, assurance, empathy, and cost rationality. This analysis elucidates the factors influencing service utilization by the elderly, with service quality serving as the core indicator of institutional capability. Furthermore, the SERVQUAL dimensions provide a structured basis for subsequent Delphi expert consultations, ensuring their relevance to the primary care context.Informed by the TQM Theory, the Delphi method is applied to establish a consensus through iterative expert rounds, effectively identifying core dimensions for capability building and providing a standardized tool for quantitative evaluation. Simultaneously, the Dynamic Capabilities Theory guides the construction of a dynamic improvement pathway for service capabilities throughout the care process.

The synergistic application of these theories forms a coherent research chain, bridging demand identification and service optimization, and connecting micro-level individual experiences with macro-level system design. This integrated approach not only enhances the methodological rigor and theoretical explanatory power of the findings but also provides a scientific basis for developing stratified and tailored improvement pathways. Ultimately, it aims to facilitate a paradigm shift in primary healthcare from a focus on "disease treatment" to comprehensive “health management.”

Chapter 3: Research Method

This research adopts a mixed-methods approach, utilizing focus group discussions, questionnaire surveys, interviews, the Delphi method, expert consultation, and statistical analysis to systematically investigate the improvement pathway on the improvement pathways of elderly health management service capabilities in primary healthcare institutions.

In the first phase, through literature retrieval, the research progress of elderly health management services in primary medical and health care institutions was systematically reviewed. Based on the SERVQUAL Model, a questionnaire for elderly health management services in primary medical and health care institutions was designed and developed. A questionnaire was designed based on the Service Quality Gap Theory and refined through focus group discussions. Subsequently, a cross-sectional survey was conducted using convenience sampling to recruit community-dwelling elderly (≥ 60 years). Data collected through these questionnaires were analyzed using descriptive statistics and logistic regression to identify key influencing factors. Data were collected via questionnaire surveys: descriptive statistical analysis was applied to depict the current status, while logistic regression analysis was employed to explore the key factors influencing elderly health management services.

In the second phase, based on the results of the current status survey and drawing on existing domestic evaluation tools, a preliminary framework for the elderly health management service evaluation index system of primary medical and health care institutions was constructed. On this basis, the Delphi method was adopted to solicit opinions from experts in the fields of health management, primary health, preventive medicine, and other related areas. Through multiple rounds of Delphi consultation, the index system was refined based on expert ratings of its systematicness, scientific rigor, and practicality, with the aim of achieving a consensus among the panelists. Finally, a multi-level evaluation system was formulated. Based on the established evaluation index system for elderly health management services in primary healthcare institutions, an assessment questionnaire was developed. Using a questionnaire survey method, an evaluation was conducted at community health centers to assess the status of health management.

In the third phase,based on the results of the current situation investigation and the application of the indicator system, the existing problems in primary healthcare institutions are analyzed, and relevant improvement recommendations are proposed.

3.1 Focus group discussion method

The focus group discussion method is a qualitative research method widely applied in social sciences and health management research (Kuo et al., 2017). Its core lies in organizing representative group members to conduct in-depth, semi-structured discussions to explore perspectives, attitudes, and behavioral patterns related to specific issues. In health management research, this method is suitable for service demand assessment and quality improvement, as it provides rich primary data to complement quantitative findings.

In this research, two rounds of focus group discussions were conducted to refine the preliminary questionnaire. Each 90-minute discussion was facilitated by an experienced moderator who guided the conversation to ensure it remained focused on the research objectives while maintaining a neutral stance. A total of eight experts in health policy, geriatric care, and primary health management participated. The discussions aimed to reach a consensus on optimizing the questionnaire's item setting, option design, and survey procedures. Thematic analysis was applied to the qualitative data derived from these discussions. The finalized questionnaire covers four dimensions: (1) Respondents' basic information; (2) Their perception, utilization, and satisfaction with elderly health management services; (3) Service quality assessment; and (4) Open-ended suggestions.

3.2 Questionnaire

The questionnaire survey method systematically collects attitudes, behaviors, characteristics, and other key information from large-sample research participants through structured questionnaires, enabling quantitative analysis of research questions. During the questionnaire design phase, validity and reliability are ensured through literature review, expert validation, and pilot testing. In the data collection phase, invalid responses are filtered out using screening questions and logical checks to maintain data quality. The collected valid questionnaires are then entered, cleaned, and analyzed using statistical tools such as SPSS.

This study developed a self-administered questionnaire to investigate the current state of elderly health management services in Shenzhen. A pilot study was conducted at community health centers in Bao'an District, leading to refinements in the questionnaire. The formal survey employed convenience sampling to recruit residents aged 60 and above, adhering to predefined inclusion and exclusion criteria.

The questionnaire assessed institutional performance across multiple dimensions, including

service facilities, commitment fulfillment, responsiveness, professional trustworthiness, and personalized care. This comprehensive evaluation aimed to identify service quality gaps and improvement areas, providing a scientific basis for enhancing service capabilities.

3.3 Interview

Interview method is a qualitative research approach through which researchers collect in-depth data regarding interviewees' experiences, attitudes, behaviors, or social phenomena by conducting structured, semi-structured, or unstructured conversations with them. In this research, both semi-structured and structured interview methods were comprehensively adopted to systematically gather multi-dimensional perspectives from different stakeholders on elderly health management services in primary medical and health care institutions. Specifically, the semi-structured interview method was employed to conduct interviews with professionals from diverse fields, including public health policy makers, administrators of primary medical and health care institutions, and geriatrics experts. This approach not only ensured the consistency of core questions (e.g., assessment of current service status, needs for policy support) but also allowed flexible adjustments to the questioning methods based on the interviewees' professional backgrounds, thereby enabling in-depth exploration of the professional insights and strategic recommendations from experts in various fields regarding elderly health management services. For community-dwelling elderly individuals, the structured interview method was used. Through standardized questions, systematic data were collected on the elderly population's service usage experiences, specific needs, and suggestions for service improvement related to health management services, providing empirical evidence for service optimization. The combination of these two methods ensures a balance between depth and breadth, capturing both in-depth professional insights and broad, systematic data on user experiences, thereby providing a comprehensive foundation for constructing a robust service system.

3.4 Delphi method

The Delphi method is an expert survey technique designed to reach a consensus through multiple rounds of anonymous questionnaires and feedback, engaging a panel of experts with relevant knowledge and experience (Liu & Meng et al., 2023; Varndell et al., 2021). It is widely applied for tasks such as policy formulation and collecting professional opinions.

In this study, the Delphi method was implemented as follows:

(1) Expert Panel Formation: An expert panel was established based on predefined inclusion criteria. The panel comprised experts from fields including clinical medicine, health management, and public health.

(2) Preliminary Scale and Questionnaire Development: Drawing on the status survey, existing tools, and interview data, a preliminary scale pool was developed. The first-round Delphi questionnaire was designed based on this pool.

(3) Iterative Rounds of Consultation: Experts independently rated each item and provided comments. Their responses were collected, analyzed, and summarized. These anonymous summaries were fed back to experts in subsequent rounds for re-rating.

(4) Consensus Achievement: The process continued for rounds until a pre-defined consensus threshold was met. This process screened key items and established their relative weights, forming the basis for the final evaluation questionnaire and improvement pathways.

3.5 Expert consultation method

Complementing the formal Delphi method, the expert consultation method in this study refers to structured one-on-one interviews conducted to gather foundational insights from domain experts. This approach was employed in the preliminary phase of constructing the evaluation index system (Bogner et al., 2009). Through these consultations with experts from multiple fields, the research gained critical understanding regarding the core concepts of elderly health management services and the key factors to be considered in their evaluation. The qualitative insights obtained through this method directly informed the development of the initial indicator pool, which served as the basis for the subsequent Delphi surveys. This sequential use of methods ensured that the formal consensus-building process was grounded in expert-derived qualitative data.

3.6 Statistical analysis method

Statistical analyses were performed on the survey data concerning the current status of elderly health management services. Data were managed using Excel and analyzed with SPSS 26.0. Descriptive statistics were used to summarize participant characteristics and service profiles, with categorical data presented as frequencies and percentages (%). Given the scale of the measurement data and its deviation from a normal distribution, non-parametric tests (e.g.,

Mann-Whitney U, Kruskal-Wallis H) were employed for group comparisons. To identify key factors influencing service outcomes, binary logistic regression analysis was conducted. A P-value of less than 0.05 was considered statistically significant for all tests.

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Chapter 4: Research Method Survey on the Current Status of Elderly Health Management Services in Primary Medical and Health Care Institutions

A comprehensive literature review was conducted to examine existing evaluation index systems for elderly health management service capabilities in primary institutions, both domestically and internationally. This review aimed to identify their strengths and weaknesses. Additionally, the service models and practices (e.g., regarding hardware, staffing, processes) of various institutions were systematically analyzed to understand the operational context and assess the applicability of existing tools. Furthermore, international experiences and best practices were analyzed through comparative studies to identify transferable strategies for enhancing service capabilities in the Chinese context.

Grounded in the Service Quality Gap Theory, an initial questionnaire on elderly health management services was developed. The questionnaire was refined through an iterative process: first, focus group discussions were held to gather qualitative feedback on its content and structure; subsequently, a pilot survey (pre-survey) was conducted to assess the instrument's reliability, validity, and practicality, leading to the finalization of the formal survey tool.

4.1 Respondents and method

4.1.1 Respondents

The elderly who participated in the free health check-ups for the elderly at community health centers were selected as the participants of this research.

The inclusion criteria were as follows: (1) Elderly individuals aged 60 and above who participated in free health check-ups at community health centers; (2) Those who provided written informed consent; (3) Those with adequate communication and comprehension abilities, capable of cooperating to complete the survey.

The exclusion criteria were as follows: (1) Patients with a confirmed diagnosis of any type of dementia; (2) Individuals with severe physical illnesses;(3) Individuals with acute or unstable physical conditions that would preclude participation.

4.1.2 Research instrument

According to the SERVQUAL Model, this research designed a questionnaire for elderly health management services in primary medical and health care institutions, which served as the primary research instrument for the on-site survey.

Before the formal questionnaire survey, a pre-survey was conducted at community health centers in Bao'an District. Five representative community health service centers in Bao'an District, Shenzhen, were selected as the pre-survey sites. An electronic questionnaire survey method was adopted, with questionnaires distributed via the Wenjuanxing platform. Staff members of the community health centers, who had received unified training, explained the content of the questionnaire and the meaning of each item in detail to the respondents to ensure the quality of the survey. A total of 83 valid questionnaires were collected (93.3% effective response rate). The pilot data were analyzed using SPSS 26.0 to assess the instrument's reliability and validity. Reliability analysis showed excellent internal consistency (Cronbach's $\alpha = 0.955$). The data were deemed suitable for factor analysis (KMO = 0.857; Bartlett's $\chi^2 = 1638.955$, $P < 0.001$). These results indicate that the questionnaire possesses high internal consistency reliability and a stable factor structure, supporting its use for subsequent large-scale surveys. The finalized instrument was deemed a reliable and valid tool for the subsequent large-scale survey.

Based on the results of the pre-survey, this research revised the questionnaire by integrating the guidance and suggestions from multiple experts in the focus group discussions, with an emphasis on combining theoretical guidance with practical needs. Specific revisions included the following: first, an item regarding the status of family doctor contracts was added. Second, considering the time constraints of on-site surveys, 5 items with similar expressions were deleted, such as "Are medical staff enthusiastic in their service attitude during consultations?" Meanwhile, the wording of the items was adjusted to local contexts, and more accessible language that aligns with the cognitive characteristics of the elderly was adopted. These revisions significantly improved the content validity and cultural adaptability of the questionnaire.

The final version, titled Questionnaire on Elderly Health Management Services in Primary Medical and Health Care Institutions' (see Appendix A), comprised 44 items. The questionnaire comprises 44 questions and divides those questions into four logically distinct modules under a modular design: (1) Background Survey Module (10 questions): This module focuses on collecting the sociodemographic characteristics of the respondents. (2) Demands, Utilization,

and Satisfaction Assessment Module (14 questions): It conducts an in-depth investigation into the elderly's needs for, utilization of, and satisfaction with health management services. (3) Elderly's Perception of Health Management Service Quality Survey Module (17 questions) (Cai et al., 2025; Wu et al., 2024): Using a Likert 5-point scale for measurement. (4) Open-Ended Question Module (3 questions): Specific suggestions from the elderly regarding health management services are collected through qualitative research questions.

The questionnaire was developed through a rigorous, multi-stage process to ensure its scientific validity and practical applicability. This process involved an iterative cycle of theoretical grounding, expert consultation , pilot testing , and further expert consultation to finalize the instrument. The pilot survey results provided an empirical basis and specific guidance for the final revisions, culminating in the formal "Questionnaire on Elderly Health Management Services in Primary Medical and Health Care Institutions." The questionnaire comprises four parts: basic sociodemographic information; the respondents' demand for, utilization of, and satisfaction with elderly health management services in primary medical and health care institutions; the investigation of elderly health management service quality; and open-ended questions.

4.1.3 Research method

This research uses a self-designed Questionnaire on Elderly Health Management Services in Primary Medical and Health Care Institutions to collect information from community-dwelling elderly individuals. Questionnaires were distributed either via the Wenjuanxing platform or as hard copies on-site, and staff members of community health centers explained the concept of the questionnaire and the meaning of each item to the respondents. Data were collected using the self-designed "Questionnaire on Elderly Health Management Services in Primary Medical and Health Care Institutions." A convenience sample of community-dwelling elderly individuals was recruited. Questionnaires were administered either electronically via the Wenjuanxing platform or as printed copies on-site. Staff members from the participating centers, who had undergone standardized training, assisted in the data collection process. Their role was to obtain informed consent, provide neutral explanations of the questionnaire items if requested, and ensure the completeness of each response, thereby maintaining data quality.

4.1.4 Analysis method

Data were analyzed using IBM SPSS Statistics 26.0. The reliability of the scale used in the pilot

study was assessed with Cronbach's alpha, and its construct validity was examined through exploratory factor analysis, for which the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity were computed. Descriptive statistics were presented as frequencies and percentages for categorical variables to summarize the participants' characteristics. Non-parametric tests were employed for group comparisons where applicable. To identify key factors associated with the elderly's demand, utilization, and satisfaction, binary logistic regression analysis was conducted. The significance level was set at $\alpha = 0.05$ for all statistical tests.

4.1.5 Quality control

Prior to the on-site survey, all staff members received uniform training on the data collection protocol. The trained staff were responsible for obtaining informed consent from all participants by clearly explaining the study's purpose and significance. Data collection commenced only after consent was secured, employing either a "one-on-one, face-to-face" interview format or by inviting respondents to complete the questionnaire independently. If any questions arose during this process, staff provided clarifications using neutral, non-leading language to avoid influencing responses.

4.2 Results

4.2.1 Basic characteristics of the respondents

Using convenience sampling, this research collected information from a total of 2,096 respondents. A total of 214 respondents were excluded due to reasons such as excessively short response time (less than 90 seconds), inconsistent age with the inclusion criteria, and errors in personal information filling. Finally, data from 1,882 respondents were included in the final analysis.data from 1,882 respondents were included in the final analysis.data from 1,882 respondents were included in the final analysis, with a questionnaire response rate of 89.79%.

Among the 1,882 respondents in this research, the average age was 71.74 ± 6.39 years. The number of female respondents (1,021, 54.25%) was higher than that of male respondents (861, 45.75%). In terms of educational background, the majority had an education level of primary school or below (1,064, 56.54%), followed by junior high school (447, 23.8%), senior high school/technical school/secondary specialized school (290, 15.41%), while those with a college degree or above were the fewest (81, 4.30%). The options included "living alone", "living only

with spouse/children", "living with spouse and children", and "living with other relatives/non-relatives". The results showed that most respondents lived with their spouses and children (1,089, 57.86%). The household living area was used to understand the regional characteristics of the elderly's living environment, with options including "residential community", "urban village", and "others". In this survey, most elderly respondents lived in residential communities (1,318, 70.03%), and 28.11% (529) lived in urban villages. Among the 1,882 elderly respondents, 1,065 (56.59%) resided in Shajing-Xinqiao Community (abbreviated as SJ-XQ), and 817 (43.41%) resided in Xixiang-Hangcheng Community (abbreviated as XX-HC). The two pairs of communities (SJ-XQ and XX-HC) were merged for analysis as they fall under the same administrative healthcare district and share common primary care service providers.

The survey results indicated that the community-dwelling elderly in Bao'an District, Shenzhen, held an overall positive evaluation of their own health status. Specifically, 77.52% rated their health as "good," 21.31% as "average," and only 1.17% as "poor." Regarding their perception of health, 77.58% agreed that "health means physical and mental well-being, free from illness and disaster"; 21.20% defined it as "being free from pain and not needing medical treatment"; and 1.22% believed it meant "feeling unwell but being told by doctors that there is no problem." In terms of chronic disease prevalence, 63.66% of the elderly had 1-2 chronic diseases, 10.36% had three or more, and the remaining 25.98% reported having no chronic diseases (see Table 4.1 for details).

Table 4.1 Basic survey on grassroots public health management services for elderly people in Bao'an district, Shenzhen

	Survey Content	Number of People	Composition Ratio / %
Age Group	60-64 years old	91	4.84
	65-69 years old	735	39.05
	70-74 years old	541	28.75
	75-79 years old	282	14.98
	80 years old and above	233	12.38
Gender	Male	861	45.75
	Female	1021	54.25
Education Level	Primary school and below	1064	56.54
	Junior high school	447	23.75
	High school / Technical school / Vocational secondary school	290	15.41
	College degree and above	81	4.30
Marital Status	Unmarried / Divorced / Widowed	203	10.79
	Married	1679	89.21
Living Arrangement	Living alone	60	3.19
	Living only with spouse/children	693	36.82

	Survey Content	Number of People	Composition Ratio / %
	Living with both spouse and children	1089	57.86
	Living with other relatives/non-relatives	40	2.13
Household Living Area	Residential community	1318	70.03
	Urban village	529	28.11
	Other	35	1.86
Which street in Bao'an District, Shenzhen do you live in?	XX-HC Street	817	43.41
	SJ-XQ Street	1065	56.59
Registered Permanent Residence (or Place of Domicile / Hukou Location)	Shenzhen	645	34.27
	Other cities in Guangdong Province	451	23.96
	Other provinces	786	41.76
Self-rated Health	Good	1459	77.52
	Fair	401	21.31
	Poor	22	1.17
What is your definition of health?	Health is being physically and mentally happy, free from illness and disaster.	1460	77.58
	Not feeling any illness or discomfort, and not needing to go to the hospital.	399	21.20
	Feeling unwell oneself, but doctors say there is no problem.	23	1.22
Number of Chronic Diseases	0	489	25.98
	1-2	1198	63.66
	3 and above	195	10.36

From the survey, the community-dwelling elderly in Bao'an District, Shenzhen, demonstrated a high level of awareness of the health management services provided by community health centers. Specifically, 95.59% of the elderly were aware that community health centers offer elderly health management services (i.e., free health check-up programs for the elderly), and 90.70% indicated a need for such services. Regarding service utilization, 73.70% of the elderly had not participated in the health management services due to "lack of time"; 13.76% held the attitude that "the services are useless"; and 13.39% "did not know about nearby service institutions". Smaller proportions of the elderly reported not participating due to economic factors (7.70%) and dissatisfaction with the attitude of the staff (3.29%).

Eighty-five point four four percent of the elderly preferred to seek medical treatment at primary medical institutions such as community health centers when experiencing discomfort like colds, while only 14.56% chose public hospitals, private clinics, or self-purchased medications. Among the elderly respondents, 93.57% had signed contracts with family doctors, and 97.72% expressed satisfaction with community health centers overall. The detailed data are presented in Table 4.2.

Table 4.2 Health management service needs, utilisation, and satisfaction of community elderly in Baoan district, Shenzhen

Survey Content		Number of People	Composition Ratio / %
Are you aware that the Community Health Center offers health management services for the elderly (free health check-up activities for the elderly)?	Do not know	83	4.41
	Know	1799	95.59
Do you need the health management services for the elderly (free health check-up activities for the elderly) provided by the Community Health Center?	Not needed	53	2.82
	Indifferent / Does not matter	122	6.48
	Needed	1707	90.70
What factors influence your decision to utilize the health management services for the elderly (free health check-up activities for the elderly) at the Community Health Center ? (Multiple factors can be selected)	No time	1387	73.70
	Consider it useless / No desired items in the service	259	13.76
	Unaware of nearby institutions offering health management services	252	13.39
	Financial constraints	145	7.70
	Poor attitude of staff	62	3.29
When you feel unwell with a condition like a common cold, which type of medical institution are you more willing to visit?	Public general hospital; Private clinic; Self-medicate by purchasing medicine from a pharmacy	274	14.56
	Primary healthcare institutions, such as	1608	85.44

Survey Content		Number of People	Composition Ratio / %
	Community Health Centers / Stations		
Have you signed a contract with a family doctor?	Yes	1761	93.57
	No	121	6.43
Are you satisfied with the overall services of the nearby Community Health Center?	Satisfied	1839	97.72
	Basically satisfied	34	1.81
	Dissatisfied	9	0.48

To measure the characteristics of the elderly's demand for and utilization of health management services more accurately, this research raised multiple-response questions to collect information from the elderly regarding health management services. Sample questions included the following: What types of health guidance can the elderly obtain from community health centers? What kind of health guidance are they more willing to participate in? What are the reasons for not participating in health education activities organized by communities or community health centers? What additional service contents do the elderly think should be included in the health management services and health education provided by community health centers? The detailed results are presented in Table 4.3.

Among the types of health guidance obtained by the elderly from community health centers, exercise guidance (84.91%) and mental health guidance (83.16%) had the highest response percentages, followed by guidance on chronic disease control and intervention methods (70.88%). In contrast, the response percentages for traditional Chinese medicine (TCM) health preservation guidance (30.92%) and dietary guidance (23.43%) were relatively low.

Regarding the criteria for selecting medical and health care institutions, geographical accessibility (i.e., proximity to place of residence) (56.38%) was the primary consideration. The importance of soft indicators such as medical staff attitude (49.20%) and service scope (48.67%) were selected at rates comparable to that of the hard indicator of professional expertise (44.31%).

Analysis of participation in health education activities showed that 67.75% of the elderly were aware of and had participated in the health education activities organized by community health centers, while 26.94% were aware of but had not participated in such activities. The main reasons for non-participation were lack of time (58.15%), lack of interest in the themes of the activities (20.76%), and the venue being too far from home (18.95%).

Among the suggestions raised by the elderly regarding the health management services and health education programs provided by community health centers, the needs for traditional

Chinese medicine health preservation (47.98%), chronic disease management (42.14%), and common disease diagnosis and treatment (38.79%) were the most prominent.

Table 4.3 Preferences and improvement suggestions for health management services for elderly people in Bao'an district, Shenzhen

Survey Content		Number of People	Composition Ratio / %
What types of health guidance can you obtain from the Community Health Center? (Multiple choices possible)	Exercise guidance	1598	84.91
	Mental health guidance	1565	83.16
	Chronic disease control and intervention methods	1334	70.88
	Assessment methods for unhealthy lifestyle behaviors	833	44.26
	Traditional Chinese Medicine (TCM) wellness guidance	582	30.92
	Dietary guidance	441	23.43
If the Community Health Center provides the following services, which type of health guidance would you prefer to participate in? (Select one or more)	Free health check-ups	1463	77.74
	Traditional Chinese Medicine (TCM) wellness and healthcare	1152	61.21
	Chronic disease control and intervention methods	901	47.87
	Dietary and nutritional guidance	838	44.53
	Health risk factor assessment	462	24.55
	Exercise guidance	147	7.81
	Psychological and emotional adjustment	120	6.38
What elements of a health service institution (like a CHC) are most important to you? (Multiple choices possible)	Proximity to residence	1061	56.38
	Enthusiastic attitude of medical staff	926	49.20
	Wide range of services provided	916	48.67
	Relevant technicians possess professional qualifications	889	47.24
	Medical staff have solid professional skills	834	44.31

Survey Content		Number of People	Composition Ratio / %
	Complete and well-equipped examination instruments and facilities	434	23.06
Do you participate in health education activities organized by the community or the Community Health Center ?	Aware of the activities and participate	1275	67.75
	Aware of the activities, but do not participate	507	26.94
	Unaware of the activities and did not participate	100	5.31
What is the reason for not participating in health education activities organized by the community or the Community Health Center ? (N=607) (Multiple choices possible)	No time to participate	353	58.15
	Not interested in the topics offered	126	20.76
	The venue is too far from home	115	18.95
	No small gifts provided	101	16.64
	Deficient service from the staff	5	0.82
What additional service content do you think the health management services and health education provided by the CHC could include?	Traditional Chinese Medicine (TCM) wellness	903	47.98
	Chronic disease management	793	42.14
	Diagnosis and treatment of common illnesses	730	38.79
	Acupuncture and physiotherapy	647	34.38
	Sub-health conditioning / Management	635	33.74
	Massage therapy (e.g., Tuina)	621	33.00
	Basic health check-ups	504	26.78
	Convenience pharmacy / On-site pharmacy	243	12.91
	Patient-Centered Convenience Pharmacy	243	12.91

4.2.2 Analysis of influencing factors on the demand for, utilization of, and satisfaction with elderly health management services

The elderly's demand for, utilization of, and satisfaction with health management services in primary medical and health care institutions served as the dependent variables. First, univariate analysis is conducted with the basic characteristics of the respondents as the independent variables. Subsequently, independent variables that demonstrated a significant association ($P < 0.05$) in the univariate analysis were subsequently included in the multivariate regression model to identify independent factors associated with the outcomes. The coding scheme for all independent variables is presented in Table 4.4.

Table 4.4 Variable assignment methods

Independent Variable	Coding Method
Age	60-64 years old = 1, 65-69 years old = 2, 70-74 years old = 3, 75-79 years old = 4, 80 years old and above = 5
Gender	Male = 1, Female = 2
Education Level	Primary school and below = 1, Junior high school = 2, High school / Technical school / Vocational secondary school = 3, College degree and above = 4
Marital Status	Unmarried / Divorced / Widowed = 1, Married = 2
Living Arrangement	Living alone = 1, Living only with spouse/children = 2, Living with both spouse and children = 3, Living with other relatives/non-relatives = 4
Household Living Area	Residential community (Xiaoqu) = 1, Urban village = 2, Other = 3
Street of Residence in Bao'an District, Shenzhen	XX-HC Street = 1, SJ-XQ Street = 2
Registered Permanent Residence (Hukou)	Shenzhen City = 1, Other cities in Guangdong Province = 2, Other provinces = 3
Self-rated Health Status	Good = 1, Fair = 2, Poor = 3
Awareness of CHC Elderly Health Management Services (Free Check-ups)	Unaware = 1, Aware = 2
Signed Contract with Family Doctor	Yes = 1, No = 2
Perception of Health	Health is physical/mental well-being, free from illness/disaster = 1, No felt illness/discomfort, no need for hospital = 2, Feel unwell, but doctor says no problem = 3
Choice of Medical Institution	Public general hospital / Private clinic / Self-medication at pharmacy = 1, Primary healthcare institutions (e.g., CHCs/Stations) = 2
Number of Chronic Diseases	0 = 1, 1-2 = 2, 3 and above = 3

4.2.2.1 Analysis of the Demand for Elderly Health Management Services

The dependent variable was defined as the perceived need for elderly health management services (free health check-ups) (0 = not needed, 1 = needed), and the independent variables

were included in the binary logistic regression analysis.

Binary logistic regression analysis was employed to explore the influencing factors of the elderly's demand for health management services. The results indicated that several factors were significantly associated with the demand on the elderly's demand for health management services ($P < 0.05$). Regarding living arrangements, compared to elderly individuals living alone, demand was significantly higher among those living only with spouses/children (OR = 2.39, 95% CI: 1.08-5.28), those living with spouses and children (OR = 3.27, 95% CI: 1.46-7.32), and those living with other relatives/non-relatives (OR = 10.94, 95% CI: 1.21-99.09). Elderly individuals with household registration in other provinces had higher demand than those with Shenzhen registration (OR = 1.65, 95% CI: 1.09-2.50). Conversely, demand was lower among those who self-rated their health as "average" (OR = 0.65, 95% CI: 0.42-0.99) or "poor" (OR = 0.24, 95% CI: 0.08-0.74) compared to "good," and among those defining health as "absence of pain and no need for hospital visits" (OR = 0.61, 95% CI: 0.41-0.93). Having 1-2 chronic diseases (OR = 1.80, 95% CI: 1.21-2.66), awareness of the services (OR = 3.72, 95% CI: 2.05-6.73), and choosing primary institutions for care (OR = 4.36, 95% CI: 2.97-6.40) were associated with higher demand. In contrast, having a signed family doctor contract was associated with lower demand (OR = 0.34, 95% CI: 0.20-0.57). Variables such as age, gender, and educational level were not statistically significant (see Table 4.5).

Table 4.5 Logistic regression analysis of the factors influencing the health management service needs of the elderly

Variables	B	SE	Wald χ^2	*P*	OR (95% CI)
Living Arrangement (Reference: Living alone)			11.01	0.012	
Living only with spouse/children	0.87	0.41	4.6	0.032	2.39（1.08-5.28）
Living with both spouse and children	1.18	0.41	8.27	0.004	3.27（1.46-7.32）
Living with other relatives/non-relatives	2.39	1.12	4.53	0.033	10.94（1.21-99.09）
Registered Permanent Residence (Hukou) (Reference: Shenzhen)			6.45	0.04	
Other provinces	0.5	0.21	5.59	0.018	1.65（1.09-2.50）
Self-rated Health (Reference: Good)			8.93	0.012	
Fair	-0.44	0.22	4.13	0.042	0.65（0.42-0.99）
Poor	-1.43	0.58	6.18	0.013	0.24（0.08-0.74）
Perception of Health (Reference: Health is physical/mental well-being, free from illness/disaster)			6.82	0.033	
No felt illness/discomfort, no need for hospital	-0.49	0.21	5.4	0.02	0.61（0.41-0.93）

Variables	B	SE	Wald χ^2	*P*	OR (95% CI)
Number of Chronic Diseases (Reference: 0)			9.2	0.01	
1-2	0.59	0.2	8.59	0.003	1.8（1.21-2.66）
Awareness of Health Management Services (Reference: Unaware)	1.31	0.3	18.82	<0.001	3.72（2.05-6.73）
Signed Contract with Family Doctor (Reference: Yes)	-1.08	0.27	16.49	<0.001	0.34（0.20-0.57）
Choice of Medical Institution (Reference: Non-primary institutions [Public hospital/Private clinic/Self-medication])	1.47	0.2	56.75	<0.001	4.36（2.97-6.40）
Constant	-1.8	1.18	2.33	0.127	0.17

Note: 1.The following variables were not statistically significant ($P > 0.05$) and are therefore not presented in the table: age group (P=0.639), gender (P=0.061), education level (P=0.168), marital status (P=0.421), household living area (P=0.180), street of residence (P=0.896), registered permanent residence in other cities of Guangdong Province (P=0.076), perception of health as "feeling unwell but doctor finds no problem" (P=0.134), and having 3 or more chronic diseases (P=0.055).
2.α=0.05.

4.2.2.2 Analysis of the Utilization of Elderly Health Management Services

Logistic regression analysis was conducted with "whether to participate in health education activities organized by communities or community health centers" as the dependent variable (0 = not participate, 1 = participate). The results indicated that several factors were significantly associated with participation in health education activities of elderly health management services ($P < 0.05$). Elderly individuals in the SJ-XQ community had 1.83 times higher odds of participating than those in the XX-HC community (95% CI: 1.47-2.28). Regarding health status, compared with those who self-rated their health as "good", the service utilization rate was significantly lower among elderly individuals who self-rated their health as "average" (OR = 0.50, 95%CI: 0.39-0.64) and those who self-rated their health as "poor" (OR = 0.38, 95%CI: 0.15-0.95). Additionally, the utilization rate was lower among elderly people who defined health as "not feeling pain or discomfort and not needing to go to the hospital" (OR = 0.68, 95%CI: 0.53-0.87). Elderly individuals who were aware of health management services had a higher utilization rate (OR = 2.75, 95%CI: 1.63-4.65), whereas those who had signed contracts with family doctors had a lower utilization rate (OR = 0.31, 95%CI: 0.20-0.48). Other factors, including age group, gender, educational level, marital status, living arrangements, household living area, household registration, another type of health perception, chronic disease prevalence, and choice of medical institution, were not significantly associated with the service utilization rate ($P > 0.05$; see Table 4.6).

Table 4.6 Logistic regression analysis of the factors influencing the utilisation of health management services for the elderly

Variables	B	SE	Wald χ^2	*P*	OR (95% CI)
Street (Reference: XX-HC Street)	0.61	0.11	29.36	<0.001	1.83（1.47-2.28）
Self-rated Health (Reference: Good)			32.55	<0.001	
Fair	-0.69	0.13	30.27	<0.001	0.5（0.39-0.64）
Poor	-0.97	0.47	4.28	0.039	0.38（0.15-0.95）
Perception of Health (Reference: Health is physical/mental well-being, free from illness/disaster)			9.84	0.007	
No felt illness/discomfort, no need for hospital	-0.39	0.13	9.5	0.002	0.68（0.53-0.87）
Awareness of Health Management Services (Reference: Unaware)	1.01	0.27	14.32	<0.001	2.75（1.63-4.65）
Signed Contract with Family Doctor (Reference: Yes)	-1.18	0.23	27.03	<0.001	0.31（0.20-0.48）
Constant	-0.05	0.81	0	0.952	

Note: 1.The following variables are not statistically significant (P>0.05) and are not listed in the table: age strata (P=0.424), gender (P=0.315), education level (P=0.151), marital status (P=0.783), living conditions (P=0.938), family living area (P=0.722), household registration in other cities of Guangdong Province (P=0.076), household registration in other provinces (P=0.237), health perception of 'feeling unwell but the doctor believes there is no issue' (P=0.763), chronic disease prevalence (P=0.326), choice of medical institution (P=0.148).
2.α=0.05.

4.2.2.3 Analysis of Satisfaction with Elderly Health Management Services

Logistic regression analysis was performed with "satisfaction with community health centers" as the dependent variable (0=dissatisfied, 1=satisfied). Female elderly individuals had significantly higher odds of being satisfied than their male counterparts (OR=2.39, 95% CI: 1.13-5.05). Compared to those rating their health as "good," those with "average" self-rated health had significantly lower odds of satisfaction (OR=0.33, 95% CI: 0.15-0.72). Elderly individuals who were aware of the services had higher satisfaction (OR=3.45, 95%CI: 1.319.07). In contrast, those who had signed contracts with family doctors had lower satisfaction (OR=0.09, 95%CI: 0.04-0.20), while those who chose primary medical institutions for medical treatment had higher satisfaction (OR=4.56, 95%CI:2.15-9.66). Other factors, including age group, educational level, marital status, living arrangements, household living area, sub-district, household registration, self-rated health, health perception, and chronic disease prevalence, were not significantly associated with service satisfaction ($P > 0.05$; see Table 4.7).

Table 4.7 Logistic regression analysis of the factors influencing the satisfaction of elderly health management service

Variables	B	SE	Wald χ^2	*P*	OR (95% CI)
Gender (Reference: Male)	0.87	0.38	5.19	0.023	2.39（1.13-5.05）
Self-rated Health (Reference: Good)			7.72	0.021	
Fair	-1.11	0.4	7.68	0.006	0.33（0.15-0.72）
Awareness of Health Management Services (Reference: Unaware)	1.24	0.49	6.32	0.012	3.45（1.31-9.07）
Signed Contract with Family Doctor (Reference: Yes)	-2.41	0.42	33.14	<0.001	0.09（0.04-0.20）
Choice of Medical Institution (Reference: Non-primary institutions)	1.52	0.38	15.71	<0.001	4.56（2.15-9.66）
Constant	1.12	2.23	0.25	0.617	

Note: 1.The following variables are not statistically significant (*P*>0.05) and are not listed in the table: age stratification (*P*=0.921), educational level (*P*=0.935), marital status (*P*=0.676), living situation (*P*=0.698), family living area (*P*=0.373), street (*P*=0.132), household registration (*P*=0.096), poor self-rated health (*P*=0.435), health cognition (*P*=0.114), chronic disease prevalence (*P*=0.427).
2.α=0.05.

4.2.3 Survey on the quality of elderly health management services

In this research, the entropy weight method-an objective weighting model that assigns higher weights to dimensions with greater data variability (i.e., lower information entropy)-was applied to calculate the weights of the six dimensions in the service quality survey. This approach aimed to objectively determine the relative importance of each dimension in shaping the elderly's perception of service quality.

The results indicated a clear hierarchy in the importance of the dimensions. Responsiveness emerged as the most critical dimension (weight = 0.283), followed by Empathy (0.200) and Cost Reasonableness (0.167). Assurance, Tangibles, and Reliability were assigned lower weights (0.133, 0.117, and 0.100, respectively). The complete weight distribution is presented in Table 4.8.

Table 4.8 Survey on the quality of health management services for the elderly

Dimension Status	Number of Questions	Weight of Each Dimension	Perceived Service Quality (P)	Expected Service Quality (E)	SQ	Weig-hted SQ
Tangibility (Completeness of facilities and equipment)	3	0.12	14.4	15	-0.6	-0.07
Reliability (Ability to fulfill health management service commitments)	3	0.10	14.4	15	-0.6	-0.06
Responsiveness (Willingness to provide health management services for the elderly)	2	0.28	9.7	10	0.3	0.08
Assurance (Credibility demonstrated by possessed attributes)	5	0.13	24.1	25	-0.9	-0.12

Dimension Status	Number of Questions	Weight of Each Dimension	Perceived Service Quality (P)	Expected Service Quality (E)	SQ	Weig -hted SQ
Empathy (Ability to provide personalized health management services for the elderly)	3	0.20	14.5	15	-0.5	-0.10
Cost Reasonableness	1	0.17	4.8	5	-0.2	-0.03
Total Score	17	1.00	81.8	85	-3.2	-0.30

In this research, the elderly's perceived service level (P) and expected service level (E) were measured across six dimensions-Tangibles, Reliability, Responsiveness, Assurance, Empathy, and Cost Reasonableness-and the gap value (SQ = P-E) was calculated. The mean scores were 81.8 (±6.4) for overall perceived service level (P) and 85.0 for overall expected service level (E), resulting in a raw service quality gap (SQ = P-E) of-3.2. After applying the dimension weights derived from the entropy weight method, the overall weighted service quality gap was calculated to be-0.30. Negative gaps were present across all dimensions. These results, based on the Service Quality Gap Model, demonstrate that the actual quality of elderly health management services failed to meet the expected standards.

Analysis of the weighted scores revealed considerable variation in service quality gaps across dimensions. The most substantial shortfalls were observed in Assurance (weighted SQ =-0.12) and Empathy (weighted SQ=-0.10). Moderate gaps were found for Tangibles (weighted SQ=-0.07) and Reliability (weighted SQ =-0.06), while Cost Reasonableness showed a relatively minor gap (-0.03). Responsiveness was the only dimension that exceeded expectations, registering a positive score (weighted SQ = 0.08; see Table 4.8).

4.2.4 Interviews on health management services for community-dwelling elderly

To gain a deeper understanding of the opinions and suggestions of community-dwelling elderly individuals regarding elderly health management services provided by primary medical and health care institutions, three open-ended questions were designed in the questionnaire: (1) What additional health management services should be provided? (2) What deficiencies exist in current services? (3) What suggestions do you have for improvement?

A total of 659 respondents provided qualitative feedback. Response rates varied across questions: 618 respondents (93.8%) suggested additional services, 220 (33.4%) identified deficiencies, and 181 (27.5%) offered improvement suggestions. The subsequent section presents a thematic analysis of this qualitative data.

In response to Question 1, the results showed that their requirement for basic medical care

services (30.30%), psychosocial support services (29.36%), and public health services (28.26%) were the most prominent, indicating that the highest needs were for basic medical care, mental health, and public health services. In addition, there was a certain level of demand for traditional Chinese medicine (TCM) health preservation services (2.83%), health education and promotion (2.35%), and home-based care services (2.04%), though their proportions were relatively low. This reflects a diversity of needs beyond core medical care, including interest in traditional medicine, health literacy, and home-based support (see Table 4.9).

For Question 2, the main issues reported by the elderly included insufficient number of staff (22.54%), relatively few examination items (13.15%), and inadequate examination equipment (12.21%). This indicates that primary medical institutions have shortcomings in terms of human resources and hardware facilities. In addition, relatively prominent issues also included long waiting times (6.57%), insufficient health education activities (5.16%), and inadequate publicity efforts (4.69%). This indicates that there is still room for optimization in service processes and health education promotion.icient health education activities (5.16%), and inadequate publicity efforts (4.69%).This indicates that there is still room for optimization in service processes and health education promotion.

Regarding Question 3, the elderly most hoped to increase examination items (29.96%) and expand health education activities, including disease prevention, medication safety, health preservation, TCM health maintenance, etc. (18.14%). This indicates that they have a high demand for early disease screening and the popularization of health knowledge. In addition, important suggestions also included increasing the number of staff (5.06%), providing home-based care services (4.22%), and strengthening humanistic care (2.95%), which reflects the elderly's emphasis on service accessibility and doctor-patient communication.

Collectively, the qualitative feedback underscores a demand for more comprehensive, accessible, and personalized health management services that address both physical and psychosocial well-being.

Table 4.9 Frequency of keywords from open-ended questions

Keywords for Question 1	N(%)	Keywords for Question 2	N(%)	Keywords for Question 3	N(%)
Basic medical and nursing services	193 (30.30%)	Insufficient number of staff	48 (22.54%)	Suggest increasing the number of examination items	71 (29.96%)
Psychosocial support services	187 (29.36%)	Limited number of examination items	28 (13.15%)	Suggest increasing health education activities, including disease prevention, medication safety, wellness, TCM health preservation, etc.	43 (18.14%)
Public health services	180 (28.26%)	Inadequate examination equipment	26 (12.21%)	Increase the number of staff	12 (5.06%)
Traditional Chinese Medicine wellness and healthcare services	18 (2.83%)	Long waiting times	14 (6.57%)	Increase home-based nursing care services	10 (4.22%)
Health education and promotion	15 (2.35%)	Few health education activities	11 (5.16%)	Suggest strengthening humanistic care	7（2.95%)
Home-based nursing care services	13 (2.04%)	Insufficient publicity/awaren-ess efforts	10 (4.69%)	Increase examination equipment	7（2.95%)
Health management services	7（1.10%)	Clinic space is too small	9（4.23%)	Increase specialist consultations	6（2.53%)
Sports rehabilitation	6（0.94%)	Lack of home-based nursing care services	5（2.35%)	Increase exercise guidance and venues	4（2.21%)
Physiotherapy	6（0.94%)	Limited variety of medicines/drugs	4（1.88%)	Suggest simplifying medical treatment and physical examination processes	3（1.27%)
Home care services	4（0.63%)	Inadequate guidance/assistan-ce for patients (way-finding)	3（1.41%)	Suggest reducing registration fees	3（1.27%)
Oral healthcare	2（0.31%)	Insufficient communication time between staff and patients	3（1.41%)	Suggest increasing the distribution of gifts	3（1.27%)
Other	6（0.94%)	Too many surveys/inquiries to participate in	3（1.41%)	Suggest strengthening follow-up for chronic diseases	3（1.27%)

Long distance to the facility	3（1.41%）	Suggest strengthening follow-up for chronic diseases	3（1.27%）
Opinions/suggestions from medical staff	3（1.41%）	Increase the variety of medications available at community health centers	3（1.27%）
High cost of diagnosis and treatment	3（1.41%）	Suggest improving the environment	2（0.84%）
Recommend enhancing staff training (e.g., communication skills)	2（0.94%）	Provide timely alerts for epidemic diseases	2（0.84%）
Lack of dental department/servi-ces	2（0.94%）	Suggest strengthening staff training	2（0.84%）
Lack of psychological counseling services	2（0.94%）	Suggest reducing non-diagnostic and treatment tasks	2（0.84%）
Lack of exercise equipment and venues	2（0.94%）	Suggest unifying the age for free elderly health check-ups nationwide	2（0.84%）
Insufficient humanistic care/patient empathy	2（0.94%）	Suggest establishing elderly outpatient clinics	2（0.84%）
Inadequate nutritional and dietary guidance	2（0.94%）	Suggest making medical treatment prices more affordable	2（0.84%）
Few staff members who understand local dialect	2（0.94%）	Hope for more convenient medical treatment processes	2（0.84%）
Limited types of medications available	2（0.94%）	Increase the number of physical examination items	2（0.84%）
Excessively long waiting times	2（0.94%）	Suggest increasing the frequency of health check-ups for the elderly	2（0.84%）
Clinic space is too small/cramped	2（0.94%）	Strengthen communication with the elderly	2（0.84%）
Other	20（9.39%）	Other	37（5.81%）

Note: 1. The 'Other' category in the table includes all keywords that appear only once.
2. Keyword composition ratio(%) = frequency of the keyword / total frequency of all keywords * 100%.

4.3 Discussions

The findings demonstrate that the demand for, utilization of, and satisfaction with health management services are influenced by multiple factors, with gaps existing across various dimensions of service quality. Relevant suggestions are also collected, which provide practical evidence for the subsequent development of pathways to enhance elderly health management services. The specific results indicate below findings: (1) Self-rated health, awareness of services, and family doctor contracting, as common factors, significantly affect service demand, utilization, and satisfaction, significantly affect service demand, utilization, and satisfaction, suggesting their central role in shaping service experiences; (2) Elderly groups who do not live alone, have household registration in other provinces, or suffer from 1-2 chronic diseases exhibit a stronger demand for services; (3) The sub-district of residence and the health perception of "not seeking medical care unless ill" are factors influencing the utilization of health management services; (4) Female elderly individuals and those who prioritize primary medical institutions for medical treatment show higher satisfaction with health management services; (5) The "Responsiveness" dimension of service quality performs well, while gaps exist in all other dimensions, among which the "Assurance" dimension has the largest gap; (6) In the open-ended questions, it was found that the elderly have the most prominent demand for basic medical care services, psychosocial support services, and public health services. This reflects shortcomings such as insufficient number of staff, relatively few examination items, and inadequate examination equipment, and suggestions were proposed" including increasing examination items and enriching health education activities. These findings provide a clear basis for the targeted optimization of the targeted optimization of elderly health management services. Crucially, the qualitative findings (point 6) corroborate and provide context for the quantitative results, highlighting the same priority areas from the perspective of the service users themselves.

4.3.1 Analysis of the impact of self-rated health, service awareness, and family doctor contracting on health management services

4.3.1.1 Self-rated health significantly influences the demand for, utilization of, and satisfaction with elderly health management services

This research found that compared with elderly individuals who self-rated their health as "good", those who self-rated their health as "average" or "poor" showed significantly different

behavioral tendencies in three aspects: demand for, utilization of, and satisfaction with health management services. These findings align with prior research, which has also documented. Elderly individuals with poor self-rated health had a significantly lower overall likelihood of receiving preventive services such as annual physical examinations, and their satisfaction with services was significantly lower. Additionally, the elderly's satisfaction with the service process and outcomes decreased significantly as their self-rated health level declined (Bleijenberg et al., 2023; Hajek et al., 2022a; Ricci-Cabello et al., 2022). The above results indicate that self-rated health not only comprehensively reflects an individual's physical, psychological, and social resource status, but also inhibits their active demand for and actual utilization of health management services. Meanwhile, this lower satisfaction may stem from a wider gap between their service expectations and the perceived reality, given their greater health needs. Therefore, this research recommends that primary health management interventions prioritize elderly individuals with poor self-rated health. More targeted support can be achieved by strengthening health beliefs, stimulating their demand for services, and optimizing service experience.

4.3.1.2 Enhancing service awareness is an effective pathway to promote the demand for, utilization of, and satisfaction with elderly health management services

Elderly individuals who "are aware of" the free health management services provided by primary medical and health care institutions have a significantly higher likelihood of being willing to participate, actually participating, and being satisfied with the services. This result is consistent with the conclusions of multiple domestic and international studies. Specifically, the demand, actual utilization rate, and satisfaction level of elderly people who are aware of the health management services offered by primary medical and health care institutions are all higher (Bleijenberg et al., 2024; Hajek et al., 2023; He et al.). Therefore, improving service awareness has been established as a highly cost-effective strategy. It is suggested that primary medical and health care institutions can establish a "medical-community-media" tripartite collaborative mechanism: In terms of medical and health care, family doctors can proactively introduce services during outpatient follow-ups; In terms of communities, publicity can be strengthened through health lectures, bulletin boards, and home visits; In terms of media, information can be pushed through platforms such as WeChat official accounts and short videos in a way that is easy for the elderly to understand, thereby enhancing service awareness through multiple complementary channels. The aforementioned approaches can effectively transform seniors' cognitive awareness of services into behavioral motivation to participate and tangible satisfaction with their experiences. Therefore, this research recommends establishing a

'medical-community-media' tripartite collaborative mechanism to provide a practical pathway for advancing healthy aging at the grassroots level.

4.3.1.3 The impact of the family doctor contracting system on the utilization and satisfaction of elderly health management

The Family Doctor Contracting System is designed to enhance elderly health management through a "demand-contract-supply" model. However, its effectiveness hinges on the quality and delivery of the contracted services. When services are not substantively provided or are poorly coordinated post-contracting, it creates an expectations-reality gap, undermining the system's goals. This study, consistent with other research (Hajek et al., 2022b; Jing, 2023; Wang, 2023), found that contracted elderly individuals reported lower subjective demand and satisfaction, potentially due to such implementation failures. To break the cycle of "signing without effective service delivery, leading to dissatisfaction and disuse," it is suggested that medical institutions strengthen performance supervision, optimize integrated service processes, and ensure the adequate allocation of medical resources to consolidate a robust "Demand-Contract-Supply" relationship.

4.3.2 Analysis of the characteristics of influencing factors on health service demand

4.3.2.1 Living with others significantly increases the elderly's demand for health management services

The survey found that the living arrangement of the elderly significantly influences their demand for health management services, and living with others can effectively stimulate a stronger willingness to utilize such services. Compared with elderly individuals living alone, those living with a spouse or children had higher service demand (OR = 2.39); those living with both a spouse and children had more significant demand (OR = 3.27); the exceptionally high odds ratio for those living with other relatives/non-relatives should be interpreted with caution due to the wide confidence interval, but it may indicate a particularly vulnerable subgroup with heightened unmet needs. All these differences were statistically significant ($P \leq 0.05$). This pattern suggests that co-residence, as a form of social support, significantly stimulates service demand-a finding consistent with existing literature.This finding is consistent with the results of multiple studies. Family interaction serves as a crucial channel for the elderly to obtain health information and adopt healthy behaviors. Elderly individuals living with family members are more likely to learn about service information through daily communication, and are more willing to use health services with the encouragement or accompaniment of their families

(Kumar et al., 2022; Rivers, 2023). Therefore, this research recommends that primary healthcare institutions develop targeted outreach and health education materials for families, leveraging their role in providing encouragement and companionship to participate in services together.

4.3.2.2 Elderly individuals with household registration in other provinces have a higher demand for health management services

Elderly individuals with household registration in other provinces demonstrated a higher demand for health management services than those with local household registration in Shenzhen (OR = 1.65). This phenomenon may reflect that the mobile elderly group face relative disadvantages in accessing health resources, thus having a more urgent demand for public services. This phenomenon suggests that the mobile elderly population, potentially facing barriers within the local social security system, relies more heavily on accessible public services like free health checks. Song and Li (2022), in their research on the health behaviors of urban migrants, also pointed out that the accessibility of public services significantly affects the health status of migrant groups. For the elderly, services such as free health check-ups may be particularly valuable, so they show a stronger willingness to use them. This result underscores the critical 'safety net' function of primary healthcare services for mobile elderly populations, highlighting their role in promoting public service equalization and protecting health rights. Therefore, this research recommends that primary healthcare institutions develop targeted outreach programs and remove systemic barriers to enhance service promotion and accessibility for the mobile elderly, thereby fulfilling their role in safeguarding health equity.

4.3.2.3 The health perception of "not seeking medical care unless ill" reduces the demand for health management services

The survey found that elderly individuals who hold the health perception of "not needing to go to the hospital if they do not feel pain or discomfort" had a significantly lower demand for health management services (OR = 0.61). This finding demonstrates that the negative perception of simply defining health as "the absence of disease and pain" significantly reduces the elderly's willingness to engage in services such as preventive care and disease screening. This finding is consistent with that of Alves and Sousa (2024): among elderly individuals with negative health perceptions, the composite utilization index for annual physical examinations, influenza vaccines, and vision screening decreased, and financial hardship could amplify this effect. This suggests that correcting passive health perceptions is crucial for improving participation. Alves and Sousa (2024) further suggest that addressing financial barriers could

enhance this effect. Therefore, this research recommends that primary healthcare institutions develop targeted health education that reframes health as proactive wellness management, using community-based workshops and peer testimonials to demonstrate the value of preventive services even when asymptomatic." Through science-based education, they should work to change the passive perception among the elderly that "absence of illness equals health," thereby enhancing their willingness to engage in health management.

4.3.2.4 A large number of chronic diseases reduces the demand for health management srvices

The impact of the number of chronic diseases on the health service demand of the elderly is not a simple "the more chronic diseases, the greater the demand", but rather a trend of first increasing and then decreasing. Compared with elderly individuals without chronic diseases, those with 1-2 chronic diseases had significantly higher service demand (OR = 1.80), while the increase in demand among those with 3 or more chronic diseases was of borderline statistical significance ($P = 0.055$), suggesting a potential plateauing or decrease in demand. This indicates that there may be an "inverted U-shaped relationship" between the number of chronic diseases and service demand. The possible reasons for this phenomenon are as follows: In the early stage of illness (with 1-2 diseases), the elderly have enhanced health awareness and are more willing to proactively manage their health through services. However, when the disease burden becomes excessive (with 3 or more diseases), the elderly may reduce their willingness and ability to seek preventive services due to the need to take multiple medications simultaneously, mobility impairments, or even physical and mental exhaustion from long-term treatment. Cao et al. (2023) found that standardized health education proved ineffective for patients with multimorbidity because it failed to address their complex treatment conflicts and significant cognitive burden. Therefore, this research recommends that primary healthcare institutions implement differentiated health interventions for elderly individuals based on the number of chronic conditions they have. For those with one or two chronic diseases, efforts should focus on promoting and strengthening health management. For elderly individuals with multiple comorbidities, who may be near or beyond this behavioral threshold, interventions should adopt a proactive, family doctor-led, integrated care model. This model should specifically aim to reduce the complexity and burden of care through coordinated appointments, consolidated medication management, and home-based service options where feasible.

4.3.2.5 Choosing primary medical and health care institutions as the first point of contact significantly increases the elderly's demand for health management services

Elderly individuals who first seek medical care at primary medical and health care institutions have a significantly higher demand for health management services (OR = 4.36). This phenomenon indicates that service continuity and residents' trust play a crucial role. Elderly people who frequently visit primary medical and health care institutions such as community health centers are more familiar with and trust the environment, staff, and services of these institutions, and this established relationship significantly mitigates perceived concerns and barriers. This finding is supported by Anton et al. (2022), who identified 'past healthcare-seeking experiences' as a key predictor of future service utilization. It suggests that familiarity with the primary healthcare system enhances the elderly's understanding of service utility and access pathways, thereby increasing willingness and creating a positive feedback loop. The more familiar the elderly are with the primary medical and health care system, the clearer they are about the utility of these services and how to access them, thereby increasing their willingness to use the services and forming a positive cycle. Therefore, enhancing the attractiveness of primary medical and health care institutions in terms of daily diagnosis and treatment is an important approach to encouraging more elderly individuals to use preventive health services. Therefore, this research recommends that primary healthcare institutions focus on optimizing the daily patient experience through measures such as reducing wait times, ensuring continuity of care with designated doctors, and providing clear communication. A positive routine care experience is foundational to building the trust necessary to encourage uptake of preventive health management services.

4.3.3 Analysis of the characteristics of influencing factors on health service utilization

4.3.3.1 The residential neighborhood is a significant factor influencing the utilization of health management services among the elderly

The proportion of elderly individuals utilizing health management services was significantly higher in the SJ-XQ Community than in the XX-HC Community (OR = 1.83, 95% CI: 1.47 – 2.28). This indicates that the configuration and delivery of primary healthcare services are critical determinants of utilization. The disparity suggests that the SJ-XQ community health system may offer greater geographic and administrative accessibility, factors which Gonzalez et al. (2023) highlight as primary structural barriers for the elderly. Furthermore, the higher uptake may reflect more proactive community health mobilization in SJ-XQ, aligning with Lee

and Kim's (2022) finding that active outreach can overcome information gaps and inertia, thereby boosting participation. Therefore, this research recommends that primary healthcare institutions systematically enhance service accessibility and user-friendliness by optimizing facility distribution, simplifying appointment procedures, and implementing proactive community engagement strategies. Emulating the practices of higher-performing communities can effectively translate potential elderly needs into actual service utilization.

4.3.3.2 Health cognition determines the utilization of health management services among the elderly

The elderly's health cognition significantly influences whether they utilize health management services. Compared with elderly individuals who perceive health as "physical and mental well-being, free from illness and disaster", those who view health as "not needing to go to the hospital if they do not feel pain or discomfort" had a lower proportion of health management service utilization (OR=0.68, 95% CI: 0.53–0.87).The elderly tend to simplistically equate health with "absence of illness," seeking medical care only when physical discomfort arises-a reactive, symptom-driven health perspective. Consequently, they often view free preventive screenings as "unnecessary" or "a waste of time." In contrast, those who perceive health as "physical and mental well-being, free from disease and distress" exhibit more positive attitudes and greater emphasis on proactive prevention. Negative health perceptions represent a key barrier hindering the elderly from utilizing preventive health services. This finding is consistent with research conducted in other contexts. For instance, studies among rural elderly populations have also found that negative health beliefs are associated with significantly lower utilization of preventive services (Liu & Wang et al., 2022; Wang et al., 2020). Therefore, this research recommends that primary healthcare institutions implement targeted health education through community outreach and family doctors. These efforts should actively promote a holistic health concept and challenge the passive belief that "no illness means health," thereby enhancing the elderly's engagement with preventive health management.

4.3.4 Analysis of the characteristics of influencing factors on health service satisfaction

4.3.4.1 Elderly females have a higher level of satisfaction with health management services

Elderly females reported significantly higher satisfaction with health management services than males (OR = 2.39, 95% CI: 1.13 – 5.05). This gender disparity mirrors patterns observed globally in healthcare. Existing literature suggests that such differences may be linked to gendered communication styles and expectations. For instance, some studies indicate that

women may place greater value on the interpersonal and emotional dimensions of care, potentially leading to more positive evaluations when these needs are met. Conversely, men might prioritize tangible, outcome-based results, as noted by Weston (2023), who found that males often seek clear, visible returns from preventive services. The persistence of this gap in the Chinese primary care context highlights the importance of gender-aware approaches. Therefore, this research recommends integrating a gender perspective into service design. Strategies could include tailoring communication for male elders to emphasize concrete benefits and outcomes, while for female elders, maintaining and strengthening service strengths in empathetic interaction and relational care.

4.3.4.2 Seeking medical care at primary medical and health care institutions significantly enhances satisfaction with health management services

Elderly individuals who sought medical care at primary institutions had 4.56 times higher odds of being satisfied than those who used non-primary institutions (95% CI: 2.15 – 9.66). This substantial difference can be attributed to the long-term, stable trust that frequent users develop with the primary care system. This established trust likely extends to other services within the same system, such as health management, thereby enhancing overall satisfaction. This mechanism is supported by Anton et al. (2022), who confirmed that past service experiences are pivotal in shaping user evaluations of new services, as familiar environments and procedures reduce uncertainty and build confidence. Therefore, this research recommends reinforcing the "health gatekeeper" function of primary institutions by systematically building continuous doctor-patient relationships. The trust earned through routine care is a critical asset for transferring positive experiences into high satisfaction and long-term adherence to health management services.

4.3.5 Multidimensional analysis of the quality of health management services in primary medical and health care institutions

4.3.5.1 The elderly have the highest evaluation of the responsiveness of health management services in primary medical and health care institutions.

Among all service dimensions, responsiveness (weighted SQ = 0.08) was the only one with a positive score, indicating that the elder's actual experience of "receiving timely services from community health centers" surpassed their prior expectations. This likely reflects the positive impact of user-friendly measures implemented in recent years, such as extended hours, simplified appointments, and telephone consultations, which have significantly enhanced

service accessibility and experience. This finding aligns with international research. Kontos et al. (2023) also emphasized that for the elderly, the most critical service quality factors are accessibility and staff pro-activity, noting that a warm and responsive attitude is more likely to earn their trust and satisfaction than hardware facilities alone. The present result confirms that primary healthcare providers' efforts in building a responsive service culture have been effective and recognized by the elderly.Therefore, this research recommends codifying and standardizing the effective practices that underpin strong service responsiveness. While continuously optimizing processes and user-friendly measures, an active and forward-looking service culture should be integrated into core components such as health management and chronic disease control, thereby tangibly strengthening the elder's sense of fulfillment and trust in primary care.

4.3.5.2 The elderly have the lowest evaluation of the assurance of health management services in primary medical and health care institutions

The research found that among all dimensions of service quality, "assurance" (weighted SQ =-0.12) was the dimension with the lowest evaluation by the elderly. "Assurance" mainly refers to service reliability, the professional competence of healthcare providers, and whether the elderly feel reassured when receiving services. This result suggests a perceived gap in the reliability and professional competence conveyed by healthcare providers during service delivery. Common concerns may include perceptions that explanations of test results are unclear, health guidance is not sufficiently detailed, or overall confidence in the providers' expertise is lacking. This finding is underscored by the research of Bennett and Douglas (2022) who noted that elderly individuals with multiple chronic conditions place a high premium on provider competence and clear communication. Any unclear explanations or uncertain attitudes will increase the elder's concerns, thereby lowering their overall evaluation of service quality. Therefore, this study recommends that primary healthcare institutions focus on strengthening training for medical staff in two key areas: first, continuously updating professional knowledge to enhance expertise; second, improving communication skills with the elderly to boost their sense of trust and security.

4.3.5.3 The elderly have a low evaluation of the empathy of health management services in primary medical and health care institutions

The "empathy" dimension (weighted SQ =-0.10) received a low score, indicating that current health management services may focus more on uniformity and standardization, while there remains a deficiency in attending to the unique needs of each elderly individual. This finding is

supported by research highlighting the importance of personalized care. For instance, Park et al. (2022) suggested that personalized services play a crucial role in enhancing patient experience and the effectiveness of health management. They found that medical institutions capable of providing personalized support achieved more significant improvements in patients' health outcomes. Research by Kiosses et al. (2023) indicated that empathy training for healthcare providers can significantly improve patients' satisfaction with services. Through training, healthcare providers can better understand patients' needs and deliver more attentive and personalized services. Enhancing the professional capabilities of healthcare providers is also a key to improving the score of the "empathy" dimension. Therefore, this study recommends that community health centers enhance empathy training for healthcare personnel, leverage digital empowerment to deliver more personalized services, intensify health education efforts, and improve the physical environment to better address the diverse needs of the elderly population.

4.3.5.4 The elderly have a low evaluation of the tangibility of health management services in primary medical and health care institutions

In this survey, the elderly gave a low evaluation of the "tangibility" dimension, with a weighted SQ of-0.07. This indicates that community health centers have deficiencies in aspects such as hardware facilities, equipment advancement, and environmental comfort, and there is still room for improvement. This result is consistent with existing research. Andalibi et al. (2023) noted that good hardware facilities and a comfortable environment can significantly enhance patients' satisfaction with medical services. They found that medical institutions with outdated facilities and insufficient equipment tend to lead to a decline in patients' overall evaluation of services. Research by Andrilla et al. (2022) also indicated that advanced medical equipment can not only improve the efficiency of diagnosis and treatment but also enhance patients' trust in and satisfaction with medical services. This is particularly critical in primary care settings serving the elderly, who, due to declining physical function, are more sensitive to environmental comfort and equipment advancedness. Due to the decline in physical functions, the elderly are more sensitive to the comfort of the medical environment and the advancement of medical equipment. A comfortable waiting area, spacious consultation room, and advanced inspection equipment can all provide the elderly with a more convenient and comfortable medical experience. Therefore, this study recommends that community health centers prioritize the upgrading and improvement of hardware facilities, optimize resource allocation-including the addition of advanced medical equipment, enhancement of waiting and consultation areas, and

reinforcement of routine facility maintenance-to boost satisfaction with health management services among the elderly.

4.3.5.5 The elderly have a low evaluation of the reliability of health management services in primary medical and health care institutions

In this survey, the reliability dimension yielded a low score (weighted SQ =-0.06), indicating that primary medical and health care institutions have weak capability to fulfill service commitments. This is consistent with the findings of multiple research studies. A survey by Al-Maqtari et al. (2022) showed that the expectation-perception gap for this dimension reached as high as-1.738, ranking first among the five dimensions. This gap was prominently reflected in insufficient fulfillment of commitments related to "on-time performance" and "getting it right the first time". In a survey on private hospitals in Iran, the authors similarly found that the weighted score for "reliability/responsiveness" was-0.88, with patients frequently reported delayed medical record retrieval and frequent service errors. Furthermore, a comparative research covering both public and private hospitals further pointed out that the gaps in the "reliability-trust" dimension reached-5.39 and-1.21, respectively. This suggests that regardless of ownership type, medical institutions have structural shortcomings in fulfilling health management service commitments and building patient trust (Al-Maqtari et al., 2022). In general, the generally low scores for reliability are a prevalent pain point in the current healthcare system that needs to be addressed, and it is recommended to implement systematic improvements through mechanisms such as standardized procedures, information-based tracking, and performance accountability. Therefore, this study recommends enhancing confidence in the stability of elderly health management services by optimizing service processes through multi-departmental collaboration, establishing standardized operating procedures to reduce implementation variability, and improving mechanisms for error remediation, all in a systematic manner.

4.3.5.6 The elderly have a favorable evaluation of the cost reasonableness of health management services in primary medical and health care institutions

The elderly’s evaluation of the "cost reasonableness" dimension was close to their expectations, with a weighted SQ of-0.03. This indicates that community health centers have performed well overall in cost management, which is largely consistent with the elderly’s expectations, though there remains the slight room for improvement. This result aligns with existing research. Lee et al. (2023) noted that cost reasonableness is one of the key factors influencing patient satisfaction. They found that when medical costs are consistent with patients’ expectations, patients’

satisfaction with services increases significantly. Research by Smith et al. (2023) also indicated that a transparent cost structure and reasonable charges can enhance patients' trust in and satisfaction with medical services. Although the findings of this study show that community health centers have performed well in terms of cost reasonableness, it is crucial to pay attention to the elderly"s specific perceptions and suggestions. For instance, some elderly individuals may have doubts about the costs of certain services or wish to receive more explanations and guidance on the cost structure. Therefore, it is recommended that community health centers continue to optimize cost management to ensure cost transparency and reasonableness, while strengthening communication with the elderly and providing detailed cost explanations and consultation services to further enhance their satisfaction with health management services.

4.3.6 Demands and recommendations for elderly health management services in primary medical and health care institutions

4.3.6.1 Demands and deficiencies of elderly health management services

Elderly individuals have the most prominent demands for basic medical care services (30.30%), psychosocial support services (29.36%), and public health services (28.26%). However, community health centers face shortcomings such as insufficient numbers of staff, a limited range of inspection items, and inadequate inspection equipment. This result is consistent with existing research. Studies have indicated that the elderly have high needs for basic medical care services, psychosocial support services, and public health services (Antonucci & Okoroduda, 2020; Blazer, 2020; Jacobs et al., 2013), which reflects their attention to health management and quality of life. Shortages of human resources compromise the accessibility, comprehensiveness, and effectiveness of medical services, ultimately diminishing service quality and patient satisfaction. Due to outdated equipment or a lack of necessary inspection equipment, some community health centers are unable to provide comprehensive health check-up services for the elderly. This not only undermines the elderly's satisfaction with health management services but also restricts the role of community health centers in disease prevention and early intervention (Ogu et al., 2022). Therefore, this research recommends prioritizing three areas of prominent needs-basic medical care, psycho social support, and public health services by increasing medical staff and updating examination equipment to address service capability gaps. It also advocates promoting an integrated service model that combines "medical treatment with prevention, and physical with mental health care" to bridge the supply-demand disparity.

4.3.6.2 Recommendations from the elderly for health management services at community health centers

The elderly expressed the strongest desires for enhancements in three key areas: an increase in inspection items (29.96%), more health education activities (18.14%) - covering topics such as disease prevention, medication safety, health maintenance, and traditional Chinese medicine (TCM) health preservation - and an increase in staffing (5.06%). This indicates that they have high expectations for early disease screening and the popularization of health knowledge. This result is consistent with the findings of other scholars. Research by Wang et al. (2022) showed that the elder's needs for health management services are not limited to disease treatment, but also include disease prevention and health promotion. Increasing inspection items can help the elderly detect potential health problems at an early stage, thereby enabling timely intervention and treatment. In addition, health education activities are crucial for improving the elder's health awareness and self-management capabilities. Liu et al. (2020) postulated that health literacy, the cultivation of which is primarily achieved through health education, serves as a pivotal determinant of self-management competencies and health outcomes among individuals with chronic conditions. Targeted and effective health education interventions for the elderly can lead to significant improvements in health behaviors and quality of life, thereby directly contributing to the overarching goals of "reducing the incidence of chronic diseases and the occurrence of associated complications."A survey by Lee et al. (2023) indicated that TCM health preservation methods such as acupuncture, tuina (Chinese therapeutic massage), and TCM herbal conditioning have significant effects on improving the quality of life of the elderly and preventing chronic diseases. Therefore, it is recommended that community health centers incorporate TCM health preservation into health management services to meet the diverse needs of the elderly.

Chapter 5: Construction of an Evaluation Index System for Elderly Health Management Service Capability in Primary Medical and Health Care Institutions

Based on the previous findings, the elder's needs for, utilization of, and satisfaction with health management services in primary medical and health care institutions are influenced by multiple factors. The results show that living conditions, household registration location, self-rated health, health literacy, chronic disease status, awareness of health management services, and family doctor contract status have significant impacts on service needs and the choice of medical institutions ($P < 0.05$). Service utilization is affected by residential neighborhood, self-rated health, health literacy, awareness of health management services, and family doctor contract status ($P < 0.05$). Meanwhile, the influencing factors of satisfaction include gender, self-rated health, awareness of health management services, family doctor contract status, and choice of medical institutions ($P < 0.05$). In addition, the survey revealed that there are gaps in the service quality for the elderly in dimensions such as assurance, tangibles, and empathy. The suggestions for improvement proposed" by the elderly-including the addition of mental health services and the optimization of resource allocation-provide direct evidence for enhancing the capability of elderly health management services in primary medical and health care institutions.

To systematically assess the capability of grassroots healthcare institutions in providing elderly health management services, this study integrates the aforementioned divergent factors and service quality gaps, while incorporating suggestions collected from elderly users. Grounded in the Service Quality Gap Theory and TQM Theory, the study designs a questionnaire based on the SERVQUAL Model for on-site investigation. Leveraging existing domestic evaluation tools, a pool of scale items is constructed. Based on this item pool, an expert consultation questionnaire is developed for Delphi method-based expert consultation. The objective is to establish a scientific and operable evaluation index system to quantify service effectiveness and guide practical improvements.

5.1 Respondents and method

5.1.1 Respondents

In this research, the purposive sampling method was adopted to select experts from fields such

as clinical medicine, health management, and public health, who are in the field of the elderly health management services in primary medical and health care institutions, as the research subjects. The experts were required to be familiar with the processes and requirements of elderly health management services in primary medical and health care institutions and were required to provide informed consent.

5.1.2 Research method

This research adopted the Delphi method. The Delphi method is an expert survey technique that seeks group consensus or future trend predictions through multiple rounds of anonymous questionnaires and controlled feedback. Participants consist of a group of experts with professional knowledge and experience in specific fields or topics. As a crucial decision-support tool, the Delphi method can effectively consolidate insights and experiences from experts in the relevant field, thereby enhancing the professionalism and accuracy of decision-making. This method has been widely applied across various fields and topics, and is particularly suitable for purposes such as future trend forecasting, policy formulation, and professional opinion solicitation.

The Delphi method's strengths lie in its anonymity and iterative feedback, which help mitigate individual and group biases. This process enhances the objectivity and scientific rigor of the results. Through this method, researchers can fully leverage experts' knowledge and experience to explore complex issues in depth and facilitate the formation of consensus. Therefore, the Delphi method plays a pivotal role in soliciting professional opinions, providing robust references for decision-makers.

Based on the results of the questionnaire, this research systematically synthesized findings from literature review and drew on references including the Reference Index System for National Model Community Health Service Centers and the Technical Specifications for Elderly Health Management. A preliminary scale item pool was thus developed, and further, an expert consultation questionnaire titled Development of an Evaluation Index System for Elderly Health Management Service Capability in Primary Medical and Health Care Institutions was formulated. The first-round consultation questionnaire is detailed in Appendix B, and the second-round consultation questionnaire in Appendix C.

Twelve experts in the field of health management were invited to evaluate the constructed Evaluation Index System for Elderly Health Management Service Capability in Primary Medical and Health Care Institutions using the developed questionnaire. Evaluation Index System for Elderly Health Management Service Capability in Primary Medical and Health Care

Institutions. Based on the consultation results, multiple rounds of revisions were carried out until a consensus was reached among the experts, resulting in the official version of the Evaluation Index System for Elderly Health Management Service Capability in Primary Medical and Health Care Institutions.

(1) Expert Selection Criteria

Based on Delphi research guidelines and the demands for elderly health management in primary medical and health care institutions, the expert selection criteria were systematically designed across three dimensions: disciplinary background, qualification requirements, and institutional type. In terms of disciplinary background, experts were required to cover fields including geriatrics, community health management, public health policy, and health economics. This interdisciplinary coverage aimed to mitigate domain bias. For institutional type allocation, a structured proportion was adopted: 50% from universities, 40% from medical institutions, and 10% from health administrative departments. This design sought to balance the depth of theoretical research and practical management experience (Zhou & Qi, 2024). This design sought to balance theoretical depth and practical management experience, ultimately forming an expert group characterized by both academic rigor and policy feasibility.

(2) Composition of the Experts

The expert panel was formed in strict accordance with the principles of interdisciplinary collaboration and functional complementary, ensuring comprehensive coverage of relevant domains: geriatrics, community health management, public health policy, nursing, and health economics. This integration of diverse and complementary perspectives ensured the representativeness and quality of the collective judgement. The contributions of the panel members were strategically aligned with their expertise: geriatrics experts focused on disease management protocols and syndrome assessment; the community health management team identified structural bottlenecks in resource allocation and service delivery; public health policy experts evaluated regulatory alignment; and health economists assessed cost-effectiveness.

(3) Multi-round Expert Consultation

The design of the expert consultation questionnaire strictly adhered to three core principles: scientific rigor, operability, and feedback validity. A Likert 5-point scale (1 = very unimportant, 5 = very important) was employed to rate the importance of each indicator, supplemented by open-ended questions to solicit expert opinions. Feedback was collected through multiple rounds of consultation until a consensus was reached among the experts.

(4) Design of Consultation Rounds

The design of the consultation rounds strictly followed the multi-round iterative principle

of the Delphi method. In the first round, an open-ended approach was adopted to collect suggestions regarding the addition, modification, or deletion of indicators, as well as quantitative assessments of their importance and feasibility. This process laid the foundation for refining the questionnaire used in the second round. The second round focused on consensus building, presenting statistical summaries of the first-round results to experts for re-evaluation. Kendall’s coefficient of concordance (Kendall’s W) was calculated to measure the degree of consistency among experts.

5.1.3 Analysis method

Data were collated and analyzed using SPSS 26.0 and Excel. The general characteristics of the experts were described using frequencies and percentages, while the Delphi scoring results were described using means and standard deviations. Indicators such as the mean value, coefficient of variation, the expert response rate were employed to assess the degree of concentration and consensus of expert opinions and corresponding criteria for indicator screening were established. The significance level was set at $\alpha = 0.05$.

5.1.4 Quality control

To control the quality of the research, the quality control measures were implemented as below.

(1) Expert Selection: Experts were selected strictly in accordance with the inclusion and exclusion criteria to ensure the misrepresentations and authority of the expert panel.

(2) Questionnaire Design: The expert consultation questionnaire was designed by integrating the results of literature reviews and on-site surveys, ensuring the comprehensiveness of its content. The first-round expert consultation questionnaire is provided in Appendix B, and the second-round one in Appendix C.

(3) Information Collection: This research adopted electronic consultation to collect experts’ opinions, ensuring the timeliness and completeness of data collection. Meanwhile, experts were reminded promptly via phone calls, text messages, and other means to improve the response rate.

(4) Research Process: The operational procedures of the Delphi method were strictly followed, with enhanced process management and quality supervision. Feedback results from each round were summarized in a timely manner, and the research protocol was dynamically adjusted accordingly.

(5) Data Analysis: Appropriate statistical methods were employed for data analysis to

ensure the validity and reliability of the findings.

5.2 Results

5.2.1 Background of experts

A total of 12 experts were invited to participate in the consultation for this research. Twelve questionnaires were distributed in both the first and second rounds, with 12 questionnaires recovered in each round, resulting in a 100% questionnaire recovery rate. The largest age group among the experts was 40–49 years old, accounting for 6 individuals (50.00%). In terms of educational background, doctoral degrees were predominant, held by 6 experts (50.00%). Regarding institutional affiliation, 6 experts (50.00%) were from universities. As for professional titles, senior senior titles (33.33%) and associate senior titles (33.33%) were the most common. The experts' work fields covered 5 areas, including clinical medicine, preventive medicine, health management, and policy management. Seven experts had more than 10 years of work experience, among whom 3 (25.00%) had over 16 years of work experience. Details are shown in Table 5.1.

Table 5.1 General information of experts (N=12)

		Frequency	Percentage (%)
Age	<30 years old	1	8.33
	30-39 years old	3	25.00
	40-49 years old	6	50.00
	50-59 years old	1	8.33
	≥60 years old	1	8.33
Gender	Male	7	58.33
	Female	5	41.67
Highest Degree Obtained	Doctor	6	50.00
	Master	4	33.33
	Bachelor	2	16.67
Work Unit	University / Higher Education Institution	6	50.00
	Medical Institution	5	41.67
	Health Administration	1	8.33
Professional Technical Title	Senior (Full) Title	4	33.33
	Associate Senior Title	4	33.33
	Mid-Level Title	3	25.00
	Other	1	8.33
Field of Expertise	Health Policy and Management	4	33.33
	Public Health	3	25.00
	Health Education	3	25.00
	Community Health Service Management(General Practice)	1	8.33
	Clinical Medicine(Geriatrics)	1	8.33

		Frequency	Percentage (%)
Years of Work Experience	≤10 years	5	41.67
	11-15 years	4	33.33
	≥16 years	3	25.00

5.2.2 Analysis of experts' validity, consensus level, and indicator variability

Two rounds of expert consultations were conducted in this research. For the two rounds, the experts' familiarity degree (Cs) was 0.875 and 0.896, respectively, and the expert judgment coefficient (Ca) was 0.817 and 0.825, respectively. The expert validity coefficient (Cr) for the two rounds was 0.846 and 0.860, respectively-both exceeding 0.7, indicating that the opinions of the experts invited in this research were reliable. A total of 24 questionnaires (12 per round) were distributed. The recovery rate for each round was 100% (12/12), resulting in an overall response rate of 100%, which meets the standard criterion of ≥ 80%. This research strictly adhered to the research norms of the Delphi method.

After two rounds of expert consultations, Kendall's Coefficient of Concordance (W) exhibited an increasing trend (W = 0.234 in the first round and W = 0.248 in the second round), indicating that the experts' opinions showed increasing consistency. Statistical analysis revealed that in the first round of consultation, no significant differences were observed in the first-level and second-level indicators ($P > 0.05$), whereas the third-level indicators showed statistical significance ($P < 0.05$). By the second round of consultation, all third-level indicators had reached the level of statistical significance. Details are presented in Table 5.2.

Table 5.2 Coordination of expert opinions

	Round 1			Round 2		
	Kendell's W	$\chi 2$	P	Kendell's W	$\chi 2$	P
Level 1 Indicator	0.199	7.174	0.067	0.289	10.400	0.015
Level 2 Indicator	0.129	12.411	0.134	0.168	16.169	0.040
Level 3 Indicator	0.227	119.835	＜0.001	0.253	133.436	＜0.001
Overall / Total	0.234	159.969	＜0.001	0.248	169.535	＜0.001

5.2.3 Summary of expert consultation results and revision of indicators

In the first round of open consultation, 3 out of 12 experts (25.0%) proposed" revision suggestions. Of the 8 indicators that were subsequently modified, 5 (62.5%) were subjects of revision suggestions raised during the first round. The initial version of the indicator system comprised 4 first-level indicators (dimensions) and a total of 45 second-and third-level indicators, resulting in an overall count of 49 individual measurement items. The coefficient of variation (CV) was calculated for each item: the CV of 56 items was below 25%, indicating a high degree of consensus among experts; the CV of 2 items (both third-level indicators) was

above 25%, suggesting moderate dispersion and certain divergences. The indicator system in the second round still contained 4 dimensions and 45 indicators. In the second round of expert consultation, the CV of all items was below 25%, indicating low dispersion and a high degree of consistency among experts. Details of the first-round consultation results are shown in Table 5.3, and details of the second-round consultation results are shown in Table 5.4.

Table 5.3 Summary of the scoring results of experts at various levels for the first round of consultations

Items	Number of People Distribution					Mean Importance Score	CV/%	IQR
	5	4	3	2	1			
Level 1 Indicators								
I-1	9	3	0	0	0	4.75±0.452	9.50	0.75
I-2	0	2	0	0	0	4.83±0.389	8.10	0.00
I-3	11	1	0	0	0	4.92±0.289	5.90	0.00
I-4	8	3	1	0	0	4.58±0.669	14.6	1.00
Level 2 Indicators								
II-1	10	2	0	0	0	4.83±0.389	8.10	0.00
II-2	8	3	1	0	0	4.58±0.669	14.60	1.00
II-3	10	2	0	0	0	4.83±0.389	8.10	0.00
II-4	9	3	0	0	0	4.75±0.452	9.50	0.75
II-5	9	3	0	0	0	4.75±0.452	9.50	0.75
II-6	12	0	0	0	0	5.00±0.00	0.00	0.00
II-7	11	1	0	0	0	4.92±0.289	5.90	0.00
II-8	7	5	0	0	0	4.58±0.515	11.20	1.00
II-9	8	4	0	0	0	4.67±0.492	10.50	1.00
Level 3 Indicators								
III-1	11	1	0	0	0	4.92±0.289	5.90	0.00
III-2	11	0	0	1	0	4.75±0.866	18.20	0.00
III-3	11	1	0	0	0	4.92±0.289	5.90	0.00
III-4	1	4	5	2	0	3.33±0.888	26.70	1.00
III-5	7	3	2	0	0	4.42±0.793	17.90	1.00
III-6	7	3	0	2	0	4.25±1.138	26.80	1.00
III-7	6	3	3	0	0	4.25±0.866	20.40	1.75
III-8	4	5	2	1	0	4.00±0.953	23.80	1.75
III-9	8	2	2	0	0	4.50±0.798	17.70	1.00
III-10	7	1	4	0	0	4.25±0.965	22.70	2.00
III-11	5	5	2	0	0	4.25±0.754	17.70	1.00
III-12	8	2	2	0	0	4.50±0.798	17.70	1.00
III-13	4	7	1	0	0	4.25±0.622	14.60	1.00
III-14	8	3	1	0	0	4.58±0.669	14.60	1.00
III-15	6	4	2	0	0	4.33±0.778	18.00	1.00
III-16	7	3	2	0	0	4.42±0.793	17.90	1.00
III-17	4	5	2	1	0	4.00±0.953	23.80	1.75
III-18	7	2	3	0	0	4.33±0.888	20.50	1.75
III-19	7	3	2	0	0	4.42±0.793	17.90	1.00
III-20	9	3	0	0	0	4.75±0.452	9.50	0.75
III-21	11	1	0	0	0	4.92±0.289	5.90	0.00
III-22	9	3	0	0	0	4.75±0.452	9.50	0.75
III-23	5	7	0	0	0	4.42±0.515	11.70	1.00
III-24	8	4	0	0	0	4.67±0.492	10.50	1.00
III-25	7	4	1	0	0	4.50±0.674	15.00	1.00
III-26	4	8	0	0	0	4.33±0.492	11.40	1.00
III-27	7	5	0	0	0	4.58±0.515	11.20	1.00

Items	Number of People Distribution					Mean Importance Score	CV/%	IQR
	5	4	3	2	1			
III-28	9	3	0	0	0	4.75±0.452	9.50	0.75
III-29	7	4	1	0	0	4.50±0.674	15.00	1.00
III-30	7	4	1	0	0	4.50±0.674	15.00	1.00
III-31	9	3	0	0	0	4.75±0.452	9.50	0.75
III-32	8	3	1	0	0	4.58±0.669	14.60	1.00
III-33	8	3	1	0	0	4.58±0.669	14.60	1.00
III-34	9	3	0	0	0	4.75±0.452	9.50	0.75
III-35	7	5	0	0	0	4.58±0.515	11.20	1.00
III-36	8	4	0	0	0	4.67±0.492	10.50	1.00
III-37	10	2	0	0	0	4.83±0.389	8.10	0.00
III-38	7	5	0	0	0	4.58±0.515	11.20	1.00
III-39	8	4	0	0	0	4.67±0.492	10.50	1.00
III-40	9	3	0	0	0	4.75±0.452	9.50	0.75
III-41	8	4	0	0	0	4.67±0.492	10.50	1.00
III-42	6	6	0	0	0	4.50±0.522	11.60	1.00
III-43	6	5	1	0	0	4.42±0.669	15.10	1.00
III-44	9	3	0	0	0	4.75±0.452	9.50	0.75
III-45	7	5	0	0	0	4.58±0.515	11.20	1.00

Note: 1. Importance Mean Score: Reflects the central tendency of perceived importance. A higher mean score indicates that the expert group collectively considers the indicator more important.
2.IQR: Interquartile Range, a key statistical indicator for measuring the dispersion (consistency) of expert opinions.

Table 5.4 Summary of the scoring results of experts at various levels for the second round of consultations

Items	Number of People Distribution					Mean Importance Score	CV/%	IQR
	5	4	3	2	1			
Level 1 Indicators								
I-1	8	4	0	0	0	4.67±0.492	10.50	1.00
I-2	9	3	0	0	0	4.75±0.452	9.50	0.75
I-3	11	1	0	0	0	4.92±0.289	5.90	0.00
I-4	4	8	0	0	0	4.33±0.492	11.40	1.00
Level 2 Indicators								
II-1	12	0	0	0	0	5.00±0.00	0.00	0.00
II-2	4	6	2	0	0	4.17±0.718	17.20	1.00
II-3	7	3	2	0	0	4.42±0.793	17.90	1.00
II-4	6	4	2	0	0	4.33±0.778	18.00	1.00
II-5	7	5	0	0	0	4.58±0.515	11.20	1.00
II-6	6	5	1	0	0	4.42±0.669	15.10	1.00
II-7	6	5	1	0	0	4.42±0.669	15.10	1.00
II-8	5	5	2	0	0	4.25±0.754	17.70	1.00
II-9	9	3	0	0	0	4.75±0.452	9.50	0.75
Level 3 Indicators								
III-1	10	2	0	0	0	4.83±0.389	8.10	0.00
III-2	8	4	0	0	0	4.67±0.492	10.50	1.00
III-3	9	3	0	0	0	4.75±0.452	9.50	0.75
III-4	1	6	5	0	0	3.67±0.651	17.70	1.00
III-5	3	3	6	0	0	3.75±0.866	23.10	1.75
III-6	2	3	7	0	0	3.58±0.793	22.20	1.00
III-7	5	7	0	0	0	4.42±0.515	11.70	1.00
III-8	3	6	3	0	0	4.00±0.739	18.50	1.50
III-9	5	6	1	0	0	4.33±0.651	15.00	1.00
III-10	5	4	3	0	0	4.17±0.835	20.00	1.75

Items	Number of People Distribution					Mean Importance Score	CV/%	IQR
	5	4	3	2	1			
III-11	3	2	7	0	0	3.67±0.888	24.20	1.75
III-12	6	5	1	0	0	4.42±0.669	15.10	1.00
III-13	3	7	2	0	0	4.08±0.669	16.40	0.75
III-14	4	7	1	0	0	4.25±0.622	14.60	1.00
III-15	6	6	0	0	0	4.5±0.522	11.60	1.00
III-16	5	7	0	0	0	4.42±0.515	11.70	1.00
III-17	3	6	3	0	0	4.00±0.739	18.50	1.50
III-18	5	6	1	0	0	4.33±0.651	15.00	1.00
III-19	6	5	1	0	0	4.42±0.669	15.10	1.00
III-20	6	4	2	0	0	4.33±0.778	18.00	1.00
III-21	7	4	1	0	0	4.5±0.674	15.00	1.00
III-22	8	4	0	0	0	4.67±0.492	10.50	1.00
III-23	4	6	2	0	0	4.17±0.718	17.20	1.00
III-24	4	7	1	0	0	4.25±0.622	14.60	1.00
III-25	4	6	2	0	0	4.17±0.718	17.20	1.00
III-26	5	4	3	0	0	4.17±0.835	20.00	1.75
III-27	1	6	5	0	0	3.67±0.651	17.70	1.00
III-28	5	6	1	0	0	4.33±0.651	15.00	1.00
III-29	6	6	0	0	0	4.50±0.522	11.60	1.00
III-30	9	1	2	0	0	4.58±0.793	17.30	0.75
III-31	3	7	2	0	0	4.08±0.669	16.40	0.75
III-32	8	4	0	0	0	4.67±0.492	10.50	1.00
III-33	6	5	1	0	0	4.42±0.669	15.10	1.00
III-34	7	3	2	0	0	4.42±0.793	17.90	1.00
III-35	7	5	0	0	0	4.58±0.515	11.20	1.00
III-36	4	6	2	0	0	4.17±0.718	17.20	1.00
III-37	5	4	3	0	0	4.17±0.835	20.00	1.75
III-38	4	5	3	0	0	4.08±0.793	19.40	1.75
III-39	6	3	3	0	0	4.25±0.866	20.40	1.75
III-40	6	5	1	0	0	4.42±0.669	15.10	1.00
III-41	6	5	1	0	0	4.42±0.669	15.10	1.00
III-42	5	3	4	0	0	4.08±0.900	22.10	2.00
III-43	5	5	2	0	0	4.25±0.754	17.70	1.00
III-44	8	3	1	0	0	4.58±0.669	14.60	1.00
III-45	6	5	1	0	0	4.42±0.669	15.10	1.00

Note: 1. Importance Mean Score: Reflects the central tendency of perceived importance. A higher mean score indicates that the expert group collectively considers the indicator more important.
2.IQR: Interquartile Range, a key statistical indicator for measuring the dispersion (consistency) of expert opinions.

This research eventually constructed an evaluation index system for elderly health management service capability in primary medical institutions via Delphi expert consultation. The system comprises 4 first-level indicators, 9 second-level indicators, and 45 third-level indicators. The first-level indicators are as follows: Functional Tasks, Resource Allocation, Content and Level of Elderly Health Management Services, and Comprehensive Management.

Functional Tasks: This category of indicators reflects the completeness of facility allocation in primary medical and health institutions, and includes 1 second-level indicator and 4 third-level indicators.

Resource Allocation: This category of indicators assesses the availability and allocation of

essential resources (human, financial, equipment) for delivering elderly health management services.

Content and Level of Elderly Health Management Services: This category of indicators evaluates the scope, depth, and quality of the health management services actually provided to the elderly.

Comprehensive Management: This category of indicators reflects the service charging model and elderly satisfaction levels, and includes 2 second-level and 3 third-level indicators.

The total score of the evaluation index system is 400 points. Following weight allocation and calculation, the assigned scores for the first-level indicators are as follows: Functional Tasks (100 points), Resource Allocation (102 points), Content and Level of Elderly Health Management Services (103 points), and Comprehensive Management (95 points). The score distribution of the second-level and third-level indicators is detailed in Table 5.5.

Table 5.5 Score situation of each indicator in the evaluation indicator system

Level 1 Indicators (points)	Level 2 Indicators	Score (points)	Level 3 Indicators	Score (points)
I1.Functional Tasks （100）	II1.Basic Functions	100	III1.Provide basic medical services, including outpatient services (e.g., general practice, traditional Chinese medicine) and diagnostic testing, as well as emergency care. Capable of performing initial diagnosis and emergency treatment for common critical and severe conditions.	27
			III2.Deliver public health services, including health education, vaccination, and reporting/management of infectious diseases and public health emergencies.	26
			III3.Provide health management services, conducting comprehensive and continuous health management for key populations (e.g., permanent residents, especially those aged 60+, patients with hypertension or type 2 diabetes) to maintain or promote health.	27
			III4.Organize no fewer than 2 health education lectures specifically for the elderly annually.	20
I2.Resource Allocation （102）	II2.Department Setup	33	III5.Establish departments including General Practice, Traditional Chinese Medicine (TCM), Rehabilitation Therapy, TCM Tuina (Therapeutic Massage), Emergency Room, and Pre-check/Triage or Fever Sentinel Point. The number of clinical departments should meet the "Construction Standards for Community Health Centers and Stations" based on the served population size.	17

Level 1 Indicators (points)	Level 2 Indicators	Score (points)	Level 3 Indicators	Score (points)
			III6. Independently establish departments for Elderly Health Management, Fever Clinic, Dentistry, and Rehabilitation.	16
	II3.Equipment Configuration	35	III7. Building area: The operational space should meet standards based on the size of the served population.	3
			III8. Bed allocation: Configured reasonably according to service scope and population, including at least 5 observation beds for daytime use or inpatient beds, with actual open beds.	2
			III9. Equip relevant devices as required by the "Notice on Issuing Basic Standards for Urban Community Health Centers and Stations," including necessary equipment for TCM services.	3
			III10. Equip hearing screening tools, vision screening tools, and psychological/behavioral screening tools.	2
			III11. Equip other devices matching the medical service categories offered.	2
			IIIIII12. Equip air disinfectors, DR (digital radiography) systems, color Doppler ultrasound, automated biochemical analyzers, coagulators, 12-lead ECG machines, cardiac monitors, ambulatory blood pressure monitors, biosafety cabinets. Provide a certain number of informatized portable devices for home visits, home visit vehicles, ventilators, remote ECG monitoring equipment, etc.	3
			III13. Sanitary toilets should be reasonably laid out; sinks in restrooms should use touchless faucets.	2
			III14. Barrier-free facilities must meet relevant standards. Medical buildings should have a barrier-free restroom on the first floor. Elevators or barrier-free ramps should be installed for two-story buildings; elevators are mandatory for three stories or more.	3
			III15. Provide necessary privacy protection measures in areas like outpatient consultation rooms, treatment rooms, and multi-patient rooms.	3
			III16. Clearly visible warning signs in areas where alerts are needed.	3
			III17. Adequate number of waiting chairs with good comfort.	2
			III18. Necessary heating and cooling equipment.	3

Level 1 Indicators (points)	Level 2 Indicators	Score (points)	Level 3 Indicators	Score (points)
			III19. Scientific and rational layout for pre-check/triage and outpatient services, with orderly, coherent, and convenient workflows.	2
			III20. Health education bulletin boards, display stands, electronic screens, and smart interactive devices, etc.	2
	II4.Staffing Configuration	34	III21. Ensure (assistant) physicians practicing in general medicine (including TCM) reach 3 per 10,000 population, public health physicians reach 1 per 10,000 population, registered nurses reach 3 per 10,000 population, and have regular volunteer support.	11
			III22. Health technical personnel must possess qualifications appropriate for their positions.	12
			III23. The center must have at least 1 licensed physician with a deputy senior title or above, at least 1 licensed TCM physician with an intermediate title or above, 1 licensed public health physician with an intermediate title or above, and 1 registered nurse with an intermediate title or above.	11
I3.Content and Level of Elderly Health Management Services（103）	II5.Willingness to Provide Health Management Services	36	III24.Billing counters must include staffed windows accepting cash payments. Smart devices should have staff assistance available to help the elderly.	12
			III25.Provide priority consultation and referral services for the elderly.	12
			III26. Offer multiple appointment channels (e.g., phone, online, on-site) to ensure smooth access to healthcare for the elderly. Volunteers should provide guidance, companionship, and advisory services.	12
	II6.Capability to Deliver Health Management Services	33	III27.Adapt information terminals and apps for elderly-friendliness, ensuring easy viewing and operation.	2
			III28 .Provide evaluation, consultation, and guidance services for polypharmacy in the elderly.	2
			III29.Capable of assessing and intervening in various geriatric health conditions like syndromes, frailty, disability, and dementia.	3
			III30.Offer home-based services (e.g., family beds, patrol visits) for homebound elderly and nursing institutions within the	3

Level 1 Indicators (points)	Level 2 Indicators	Score (points)	Level 3 Indicators	Score (points)
			jurisdiction, including one-click call services.	
			III31.Provide health nursing and hospice care services for elderly in need within the jurisdiction.	2
			III32.Conduct physical and auxiliary examinations for the elderly, assessing their lifestyle and health status.	3
			III33.Establish individualized health records for the elderly. Compare, analyze, and summarize annual health check-up results to propose improvements and generate corrective reports.	3
			III34.Interpret annual health check-up results for the elderly, provide daily life health guidance, and offer follow-up services.	3
			III35. Provide chronic disease prevention guidance and treatment services for the elderly.	3
			III36.Offer TCM healthcare services, delivering ≥6 types of TCM therapies (e.g., herbal medicine, acupuncture, tuina, cupping, topical applications, guasha, fumigation/washing, acupoint injection, hot compression, daoyin).	2
			III37. Distribute ≥6 types of TCM or integrated TCM-WM health education prescriptions and materials annually to promote TCM disease prevention and health knowledge.	2
			III38.Provide ≥2 types of TCM preventive healthcare services for common chronic diseases (e.g., hypertension, diabetes) in the elderly.	2
			III39.Utilize TCM methods (e.g., herbs, acupuncture, massage, fumigation) for rehabilitation of ≥2 conditions like post-stroke sequelae and physical disabilities.	3
	II7.Service Level	34	III40.Achieve the national target for elderly health management service coverage, reaching ≥65% of the elderly in the jurisdiction.	11
			III41.Standardize the implementation of family doctor contract services for the elderly, achieving a signing rate of at least 70% among the elderly population within the jurisdiction.	12
			III42.Standardize TCM health management services for the elderly, achieving a ≥70% TCM health management rate.	11

Level 1 Indicators (points)	Level 2 Indicators	Score (points)	Level 3 Indicators	Score (points)
I4.Comprehensive Management（95）	II8.Cost Reasonableness	45	III43.Formulate institutional medical insurance management measures, implementation rules, and charging systems. Establish internal management systems for the use of medical security funds, with designated departments or personnel responsible for the management of medical security fund usage.	22
			III44.Strictly adhere to medical insurance agreements, provide reasonable diagnosis/treatment and charging, and strictly implement medical insurance drug, consumable, and service item catalogs.	23
	II9.Elderly Service Satisfaction Rate	50	III45.Satisfaction Rate = (Number of Survey Respondents Reporting Comprehensive Satisfaction / Total Number of Survey Respondents) × 100%	50

5.3 Discussions

Focused on the constructed evaluation system for elderly health management services in primary medical and health institutions, this research intends to elaborate on the following four aspects. (1) Analyze the validity of the expert consultation results; (2) Analyze the gradual convergence of expert consensus; (3) Analyze the rationality of the evaluation index system in terms of structural dimension division, indicator content design, and practical operational performance; (4) Explore the practical guiding value of the evaluation index system in promoting the optimal allocation of resources in primary medical and health institutions, the transformation of service models, and the precise response to the elderly’s needs for health management services. Through the analysis of the above content, this research aims to demonstrate the system's scientific foundation, practical applicability, and potential for broader implementation.

5.3.1 High validity of expert consultation

The expert consultation in this research demonstrated high validity and reliability. The validity coefficients (Cr) of both rounds of consultation were significantly higher than the internationally recognized acceptable threshold (0.7). These data indicate that the expert consensus results obtained in this research are of high quality and comply with the normative requirements of academic research. This is consistent with the research conclusion of Alsaqqa

et al. (2023), who argued that when the validity coefficient (Cr) exceeds 0.8, expert consensus can be regarded as the “gold standard”. Furthermore the composition of the expert panel in this research was scientifically rational: 50% of the experts were from universities; regarding professional titles, 66.66% held senior positions. This composition aligns with the viewpoint proposed by Smith et al. (2023) and Brown et al. (2025) that “the professional background and experience of experts are key to the effective implementation of the Delphi method”.

5.3.2 Expert consultation reach common sense

The research strictly followed the standardized procedures of the Delphi method. The Kendall's coefficient of concordance (W) increased from 0.234 in the first round to 0.248 in the second round, indicating a gradual improvement in the consensus among experts' opinions. The experts' opinions showed a favorable convergent trend: in the first round of consultation, 25% of the experts proposed" revision suggestions, among which 62.5% of the controversial items were adopted and revised; by the second round of consultation, consensus was reached on all indicators, with coefficients of variation (CV) all below 25% and all achieving statistical significance ($P < 0.05$) with coefficients of variation (CV) all below 25% and all achieving statistical significance ($P < 0.05$). This dynamic optimization process, which enhanced the validity and reliability of the system, is highly consistent with the "iterative indicator development approach" advocated by the World Health Organization (2023), confirming that this research complies with international norms in terms of methodology. This finding is consistent with the conclusions of Chen et al. (2022), both indicating that the Delphi method can gradually resolve divergences through feedback, significantly improving the scientific rigor and refinement of indicator screening. It is particularly suitable for constructing consensus-based comprehensive evaluation tools.

5.3.3 The evaluation system is characterized by scientific rigor and operability

The research constructed an evaluation system comprising 45 specific indicators for assessing the elderly health management service capability of primary medical institutions. The system exhibits three key strengths: first, comprehensive coverage, as it examines both objective conditions such as hardware facilities and subjective perceptions including satisfaction; second, scientific design, where expert consultation ensures the professionalism and validity of the indicators; third, strong practicality, with each indicator being clear and specific to facilitate practical operation. The design concept of this evaluation system aligns with the findings of

multiple international studies. Liu et al. (2023) also adopted the Delphi method to construct an evaluation system with 45 indicators, confirming the effectiveness of the multi-dimensional framework of "hardware-service-satisfaction" in the assessment of primary elderly services. A review by García and Fernández (2022) emphasized that existing assessment tools often overlook the specific needs of the elderly, such as chronic disease management and mental health. In response to this gap, this research specifically incorporates indicators for "chronic disease management" and "psychological support", making the evaluation system more relevant to the needs of the elderly population.

5.3.4 The multi-dimensional evaluation system provides improvement pathways for primary medical institutions

The evaluation system constructed in this research can provide primary medical and health institutions with specific improvement guidance in three aspects: First, by assessing functional tasks and resource allocation, it helps institutions identify deficiencies in hardware facilities and staffing; second, by examining service content and quality, it drives the transformation of service models from the traditional "disease treatment" to the more comprehensive "health management"; third, leveraging feedback from comprehensive management indicators, it facilitates the optimization of service processes and the overall improvement of service quality. Particularly against the backdrop of identifying the elderly's strong demand for mental health and traditional Chinese medicine (TCM) healthcare services, the system can offer clear guidance for expanding these service contents. This improvement pathway is mutually corroborated by the conclusions of multiple international studies. The empirical research by McConnell (2023) further indicates that for every 10% increase in an institution's comprehensive evaluation score, the probability of its service model transforming to "health management" rises by 18%, providing quantitative evidence for the index system's role in driving service transformation. Research conducted by Li et al. (2023) shows that implementing interventions based on the collaborative care model can significantly improve the completion rates of multiple core elderly services, including chronic disease management, frailty screening, and mental health support, while also markedly enhancing elderly patients' satisfaction with service coordination and humanistic care. This empirical research provides direct support for the design philosophy that emphasizes systematically responding to the complex needs of the elderly through structured, multi-dimensional assessment. Therefore, the evaluation system constructed in this research demonstrates strong alignment with international studies in its improvement logic. Moreover, by focusing on the elderly's needs for mental health and TCM

healthcare, it provides primary institutions with more targeted and operable improvement guidelines.

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Chapter 6: An Empirical Research on the Evaluation Index System for Elderly Health Management Service Capability in Primary Medical and Health Institutions

Based on the constructed evaluation index system, a questionnaire was developed to assess the elderly health management service capability of primary medical and health institutions. An empirical study was conducted on primary medical and health institutions to identify the current deficiencies in elderly health management service capability, thereby providing a practical basis for formulating subsequent policies and recommendations.

6.1 Respondents and method

6.1.1 Respondents

This research adopted a purposive sampling method, selecting community health centers that provide elderly health management services in Bao'an District, Shenzhen as the target institutions for investigation, and conducted a questionnaire survey among the medical staff.

6.1.2 Research method

The constructed evaluation index system was converted into an Assessment Form for Elderly Health Management Service Capability of Primary Medical and Health Care Institutions (see Appendix D). A survey was conducted among community health centers in Bao'an District, Shenzhen. Investigators comprehensively assessed the actual status of elderly health management service capability in these community health centers through semi-structured interviews and questionnaires.

6.1.3 Quality control

Investigators were given unified training to ensure consistency in aspects such as questioning respondents and explaining the survey content. They clarified the purpose and significance of this research to the medical staff of community health centers. Upon obtaining their consent, investigators conducted "one-on-one, face-to-face" interviews to collect information related to

the elderly health management service capability of primary medical and health care institutions, and then completed the assessment form. If respondents raised questions, investigators provided explanations and clarifications without inducement.

6.2 Results

This research selected HuangTian Community Health Center and SanWei Community Health Center for on-site investigation based on criteria such as the size of the served population and the implementation status of health management programs.

6.2.1 Interview results of medical staff at community health centers

This research interviewed 10 medical staff members engaged in elderly health management services at community health centers in Bao'an District, Shenzhen, including general practitioners, public health physicians, and nursing staff. Through semi-structured interviews, it systematically collected qualitative data related to elderly health management service capability, with a focus on content such as the usage of existing service items by the elderly and improvement suggestions identified by medical staff in practice, as well as problems in elderly health management services and proposed solutions.

The interview results reveal two key characteristics of current health service needs among the elderly. Firstly, regarding the content of health management services, medical staff indicate that the elderly generally expect an expansion of health examination items, and suggest adding specialized tests such as X-rays, cardiac color Doppler ultrasound, and carotid artery color Doppler ultrasound to the existing examination panel. Secondly, in terms of the utilization of health management services, medical staff report that some elderly individuals lack sufficient willingness to actively participate in health management. They propose providing practical health-related gifts appropriately during activities like health education to effectively boost the elderly’s enthusiasm for participation. These findings provide important practical evidence for optimizing community-based elderly health management services.

During the implementation of health management services for community-dwelling elderly, medical staff reported two primary challenges. Firstly, the high mobility of community elderly leads to incomplete coverage of health education and promotion. They suggest establishing an information-sharing mechanism between community grid managers and community health centers to achieve real-time updates on the elderly’s residential dynamics and deliver timely health education. Secondly, medical staff are often mistaken for fraudsters by the elderly during

telephone follow-ups, which undermines the utilization of health management services. They recommend that government departments conduct health management service promotions through multiple channels such as television, radio, and the Internet to enhance the elderly's understanding of such services.

6.2.2 Survey results of community health centers

This research selected two institutions, HuangTian Community Health Center and SanWei Community Health Center, to assess their elderly health management service capability. It evaluated 45 indicators across four dimensions: functional tasks, resource allocation, content and quality of elderly health management services, and comprehensive management. The results show that the total scores of the two centers for elderly health management service capability are 376 points and 378 points, respectively, out of a maximum of 400 points (see Table 6.1 for details).

Table 6.1 Evaluation scores of primary and secondary indicators for the two community health centers

Level 1 Indicators	Level 2 Indicators	HuangTianCommunity Health Center（points/%）	SanWeiCommunity Health Center（points/%）
Functional Tasks		100(100%)	100(100%)
	Basic Functions	100(100%)	100(100%)
Resource Allocation		81(79.41%)	80(78.43%)
	Department Setup	15(45.45%)	15(45.45%)
	Equipment Configuration	32(91.43%)	31(88.57%)
	Staffing Configuration	34(100%)	34(100%)
Content and Level of Elderly Health Management Services		102(99.03%)	101(98.06%)
	Willingness to Provide Health Management Services	36(100%)	36(100%)
	Capability to Deliver Health Management Services	32(96.97%)	31(93.94%)
	Service Level	34(100%)	34(100%)
Service Level		95(100%)	95(100%)
	Cost Reasonableness	45(100%)	45(100%)
	Elderly Service Satisfaction Rate	50(100%)	50(100%)
	Total	376(94.00%)	378(94.50%)

Note: "%" refers to the score rate, defined as the ratio of the actual score obtained to the maximum possible score for a given indicator.

In terms of functional tasks, both community health centers achieved a full score of 100 points, indicating that their basic functions have gained full recognition.

Regarding resource allocation, HuangTian Community Health Center scored 81 points (79.41%), while SanWei Community Health Center scored 80 points (78.43%). Specifically: For department setup, both HuangTian and SanWei Community Health Centers scored 15 points (45.45%), as neither has established independent departments for elderly health management, stomatology, or rehabilitation.For equipment allocation, HuangTian Community Health Center scored 32 points (91.43%), and SanWei Community Health Center scored 31 points (88.57%). For personnel allocation, both centers achieved a full score of 34 points (100%).

In terms of the content and quality of elderly health management services, HuangTian Community Health Center scored 102 points (99.03%), and SanWei Community Health Center scored 101 points (98.06%). Specifically: Both HuangTian and SanWei Community Health Centers achieved a full score of 36 points (100%) for their willingness to provide health management services.For the capability to deliver health management services, HuangTian Community Health Center scored 32 points (96.97%), and SanWei Community Health Center scored 31 points (93.94%).For service quality, both centers achieved a full score of 34 points (100%).

In the dimension of comprehensive management, both HuangTian and SanWei Community Health Centers achieved a full score of 95 points (100%). Specifically:Both centers scored a full 45 points (100%) for fee reasonableness.Both centers also scored a full 50 points (100%) for elderly service satisfaction.

In general, the two community health centers demonstrate overall strong performance, but still have deficiencies in the dimension of resource allocation-particularly in department setup and equipment allocation, which require urgent enhancement.

6.3 Discussions

This research finds that community health centers in Bao'an District, Shenzhen, deliver high-quality services. However, results from interviews with medical staff and empirical research indicate that gaps remain in elderly health management services provided by primary medical and health care institutions. This chapter will elaborate on the following four aspects. First, exploring the contradiction between the elderly’s demand for health check-ups and the services provided by primary institutions. Second, analyzing how the high mobility of the elderly

undermines the effectiveness of health management services. Third, examining the shortcomings in personalized services. Fourth, analyzing the inadequacy of institutional equipment allocation. By discussing the above aspects, this chapter aims to comprehensively reveal the key problems and challenges faced by primary elderly health services in demand matching, resource allocation, and service effectiveness, thereby providing theoretical support and practical pathways for optimizing the health management service system and improving service quality.

6.3.1 The contradiction between the elderly's demand for health check-ups and primary-level services

Interviews with medical staff at community health centers reveal that the elder's current demand for health check-ups is no longer limited to basic items (e.g., blood pressure and blood glucose measurements), but has increasingly expanded to more advanced imaging examinations, such as X-rays, cardiac color Doppler ultrasound, and carotid artery color Doppler ultrasound. This finding aligns with multiple research studies. Shen et al. (2023) identified the issue of "insufficient personalization" in current health check-ups for the elderly, noting that many tests truly needed by the elderly are not included in routine packages. A study by Wang et al. (2022) on health examination services for older adults in China reveals that this demographic generally exhibits strong demand for such services, with their expectations evolving beyond basic check-ups. There is a particularly heightened anticipation for comprehensive early screening services, including cardiac color ultrasound and bone density testing. However, the study identifies a significant supply-demand gap: standardized services provided by primary healthcare institutions are inadequate in meeting these deeper needs for precise and personalized screening, resulting in lower-than-expected utilization rates. In response, the researchers emphasize that addressing this challenge requires optimizing resource allocation through mechanisms such as enhancing medical consortium collaboration, thereby improving primary-level service capability and better fulfilling the health demands of the aging population. Within China's basic public health service program, funding is primarily allocated to basic check-up items. Consequently, many advanced examinations (e.g., carotid artery color Doppler ultrasound) still require out-of-pocket payment or referral to higher-level hospitals. This disparity underscores the necessity of optimizing both check-up content and resource allocation within the primary-level service system. This research suggests expanding primary-level check-up items and optimizing resource allocation to meet the elder's personalized health needs and improve service quality and efficiency.

6.3.2 The impact of the elder's high mobility on the effectiveness of health management services

Medical staff reported that the high mobility of community-dwelling elderly, coupled with insufficient timeliness of full-coverage health education, poses a challenge for primary medical and health care institutions in delivering health management services. The elderly often interrupt their health services due to residential relocation and struggle to obtain timely updated health guidance and activity information. This conclusion aligns with the findings of multiple studies. Smith et al. (2023) found that the mobility of community-dwelling elderly significantly impairs their access to continuous medical services, as the elderly cannot sustain participation in health management due to moving house or relocating with their children. Garcia et al. (2022) further pointed out that delayed information updates are particularly detrimental to the mobile elderly population, preventing them from accessing critical health information in a timely manner and creating an "information gap". To address this issue, research by Wang et al. (2023) proposed that primary medical and health care institutions should establish more flexible information tracking systems. In communities that have introduced digital information update tools, the elder's participation rate in health management has increased by 27%. The aforementioned studies indicate that proactively addressing these mobility and information access challenges is key to improving service effectiveness. To bridge this gap, this research suggests that primary institutions strengthen information infrastructure development to ensure the elderly can sustain participation in health management and access health information promptly.

6.3.3 Shortcomings in personalized health management services

The survey reveals that primary medical and health care institutions have shortcomings in department setup-for instance, the lack of independent elderly health management departments undermines the ability to meet the elder's personalized health management needs. Multiple studies indicate that establishing independent departments contributes to the improvement of personalized services. A survey conducted by Li et al. (2023) on 4,672 elderly patients with chronic diseases nationwide shows that only 28.6% of primary institutions have independent health management departments, and as many as 62% of respondents have never received personalized dietary or exercise advice. An observational study by Thompson et al. (2024) on 1,200 community centers further finds that 45% of institutions lack mental health service units, resulting in a depression screening rate of less than 20% among the elderly. This suggests that

the absence of functional departments directly restricts the provision of personalized services. In addition, a study by García et al. (2022) indicates that addressing the shortcomings in department setup can effectively improve the quality of personalized services. Therefore, this research suggests incorporating "the establishment of independent elderly health management departments in institutions" into the evaluation index system, thereby promoting greater institutional focus on the personalized needs of the elderly.

6.3.4 Inadequate institutional equipment allocation

The survey reveals a low score for equipment allocation, reflecting a shortage and irrational distribution of equipment that fails to meet the demands of elderly health management services. This finding aligns with the research results of Sun, Li, and their colleagues. Sun et al. (2023) conducted an in-depth analysis of the impact of equipment allocation on the quality of primary health care services for the elderly, and clearly pointed out that the medical equipment in existing primary institutions is generally outdated and insufficient, and seriously mismatches the health management needs for common diseases and chronic diseases among the elderly-this issue directly limits the scope and quality of service provision. Li et al.(2023) explicitly stated that primary medical and health care institutions in China face severe insufficiency and imbalance in the allocation of resources such as human resources and equipment, which directly results in low-quality management services for elderly patients with chronic diseases. Resource scarcity and irrational allocation prevent primary institutions from effectively addressing the complex health needs of the elderly, hindering the improvement of universal health coverage and the achievement of healthy aging goals. Therefore, this research recommends prioritizing the procurement and strategic allocation of medical equipment for elderly health management to enhance service quality and efficiency in primary institutions.

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Chapter 7: Recommendations for Enhancing the Elderly Health Management Service Capability of Primary Medical and Health Institutions

Health management is a crucial pathway to achieving healthy aging. Primary medical and health institutions are the main providers of elderly health management services, and their service capability directly influences the demand for, utilization of, and satisfaction with such services among the elderly. This research identified gaps across multiple dimensions of service quality: notably, the elderly expressed doubts about the professional competence of primary care medical staff; the elderly also reported shortcomings including insufficient staffing, a limited range of inspection items, and inadequate testing equipment at primary medical and health institutions. Therefore, the elderly health management services at primary medical and health institutions require further improvement and enhancement. Based on the above research findings, this chapter proposes recommendations for enhancing the elderly health management service capability of primary medical and health institutions from the macro, meso, and micro levels, integrating the dynamic capability theory and digital transformation. These recommendations aim to provide references for managers and decision-makers of elderly health management services at primary medical and health institutions, and to promote the high-quality development of such services.

7.1 Macro level: resource optimization and quality monitoring

7.1.1 Resource optimization: enhancing the capability of primary health management services

At the national level, optimize medical resources to achieve systematic enhancement of the elderly health management service capability. It is crucial to strengthen systematic support for primary medical and health institutions; comprehensively improve the accessibility and professionalism of health management services through fiscal subsidies, age-friendly facility renovations, professional talent training and introduction, and other measures. Continuously advance programs such as the "High-Quality Service at the Grassroots Level"; utilize these

programs as a catalyst to drive the sinking of elderly health management resources and the innovation of service models, and strengthen the health management service capability of primary medical and health care institutions including community health service centers and township health centers. Establish an efficient inter-regional resource allocation and mutual assistance system to promote the extension of high-quality medical resources to the primary level. Meanwhile, the state needs to guide the tilt of public health resources more towards the field of elderly health management, increase investment in primary service outlets and elderly health clinics, and expand services such as health monitoring, chronic disease prevention and control, and rehabilitation nursing.

7.1.2 Quality monitoring: constructing a scientific evaluation index system

China should establish a unified and scientific evaluation index system for the elderly health management service capability of primary medical and health institutions, covering dimensions such as functional tasks, resource allocation, content and quality of elderly health management services, and comprehensive management. This system should ensure the scientific rigor and operability of health management service assessment. A dedicated institution could be established to organize and implement assessment and supervision work, ensuring the objectivity and accuracy of assessment results. Assessment outcomes should be publicly disclosed on a regular basis to enhance transparency and public accountability. Furthermore, the public disclosure of assessment results can foster healthy competition among primary medical and health institutions across different regions, as well as promotes resource sharing and cooperation. Policies should be timely adjusted based on assessment results to continuously improve the quality of elderly health management services at primary medical and health institutions and drive service optimization.

7.2 Meso level: interdepartmental collaborative governance and technical support

7.2.1 Collaborative governance: clarifying multidepartmental responsibilities and strengthening coordination

Determing the responsibilities of multiple departments and strengthening coordination constitute a key pathway to enhancing elderly health management. It is recommended that the health administrative department take a holistic approach to formulate the content and technical

standards for elderly health management; the civil affairs department provide the basic information database of the elderly; the public security authorities share real-time data on residential changes; and the comprehensive governance department incorporate elderly health management tasks into the performance assessment of community grid managers. This will establish an interdepartmental collaboration mechanism characterized by "list-based responsibilities, shared data, and index-based assessment". Simultaneously, it is essential to establish an information linkage platform between community health service centers and grid members should be established to realize real-time updates of the elderly's residential dynamics and cross-regional circulation of health records. This ensures that health management services accurately follow the mobility of the target population, effectively improving the accessibility and continuity of health education for the mobile elderly population.

7.2.2 Technical support: a sound training system and expert network support

Enhancing the elderly health management service capability of primary medical and health institutions requires support from a sound training system and an expert network. In this research, the "assurance" dimension of service quality exhibited the largest gap, indicating that the elderly harbor doubts about the professional competence of medical staff at primary institutions. It is recommended that Department of Health organize training regularly for staff of primary medical and health institutions, covering areas such as chronic disease diagnosis and treatment, disease prevention, and health education, to improve their professional proficiency. These departments should encourage relevant medical personnel to participate in professional qualification examinations, and track training effectiveness through archives and assessment mechanisms. Meanwhile, an expert pool encompassing fields such as chronic diseases, public health, and health education should be established to provide technical consultation for primary medical and health care institutions. Experts should regularly organize academic lectures and discussions on difficult cases to facilitate experience sharing. Continuous technical support should be provided to primary medical and health care institutions through online technical guidance, remote training, and other approaches. The establishment of such an expert pool, coupled with regular academic activities and continuous online support, will strengthen technical exchange and elevate the overall service capability.

7.2.3 Health education: enhancing awareness of elderly health management services

Strengthening health education institutions a crucial way to enhance the elderly health

management service capability of primary medical and health care institutions. Strengthening health education institutions a crucial way to enhance the elderly health management service capability of primary medical and health care institutions. The Department of Health should intensify health education and promotion efforts through multiple channels such as television, radio, and the Internet, providing practical guidance tailored to the elderly to improve their awareness of health management. Meanwhile, health education and promotion should be conducted in diverse forms, including health lectures, free medical consultation activities, and community outreach, to enhance elderly engagement. Emerging media such as digital platforms and artificial intelligence should be leveraged to expand the coverage and influence of health education and promotion information. Promotional materials such as videos and posters should be designed to deliver knowledge on disease prevention, medication safety, health maintenance, traditional Chinese medicine (TCM) health preservation, and other related areas to the elderly in a concise and intuitive manner.

Epartment of Health should intensify health education and promotion efforts through multiple channels such as television, radio, and the Internet, providing practical guidance tailored to the elderly population to improve their awareness of health management. Meanwhile, health education and promotion should be conducted in diverse forms, including health lectures, free medical consultation activities, and community outreach, to increase the elder's participation. Emerging media, such as digital platforms and artificial intelligence, should be leveraged to expand the reach of health education by developing promotional materials like videos and posters that deliver knowledge in a concise and intuitive manner.

7.3 Micro level: dynamic capability enhancement and digital construction

7.3.1 Sensing capability: establishing a demand identification mechanism for elderly health management services

Primary medical and health care institutions should establish a demand identification mechanism for elderly health management services, and provide targeted services for health intervention. It is recommended that institutions conduct comprehensive health assessments and multidisciplinary consultations for the elderly, collaborate with communities to carry out free medical consultation activities, and apply health risk prediction models to achieve intelligent data early warning, thereby proactively capturing both explicit and potential health needs of the elderly. By strengthening specialized training in geriatrics for medical staff and

organizing interdisciplinary integration seminars, institutions can enhance their ability to deeply understand and analyze complex needs. Through dedicated personnel tracking, process optimization, and dynamic service updates, targeted health intervention programs should be developed to effectively translate identified needs into precise services. This will continuously enhance the institutions' environmental adaptability and sustainable service capability.

7.3.2 Learning capability: establishing a learning mechanism to enhance service professionalism

Primary medical and health care institutions should establish a learning mechanism to enhance the professionalism of elderly health services. In response to the finding of this research that the "assurance" dimension exhibited the largest gap in the service quality survey, indicating the elder's doubts regarding staff professionalism, it is recommended that institutions conduct monthly case-based learning sessions to convert identified service deficiencies into targeted knowledge improvement. Relying on continuing education programs, institutions should co-establish an "industry-university-research-training" collaborative network with colleges / universities and upper-level hospitals to offer courses on geriatric health management. They should promptly introduce new knowledge in geriatrics, appropriate technologies, and assessment tools, and organize medical staff to absorb and transform external knowledge through internal training, skill drills, and other approaches. Through case discussions and learning activities targeted at specific needs and shortcomings, medical staff can effectively translate acquired knowledge into practical application.

7.3.3 Integration capability: integrating external resources to strengthen internal capabilities

Primary medical and health care institutions should integrate external resources into their internal capabilities. An external resource identification and internalization mechanism should be established. This mechanism should ensure that, upon receiving new policies, intelligent equipment, or project funds, institutions promptly develop and implement tailored measures through specialized training, process adaptation, and localized revision. They should conduct knowledge and skill training, and build a shared knowledge repository containing comprehensive geriatric assessments and updated clinical guidelines. Additionally, new service modules such as the integration of medical and elderly care services, and internet-based nursing care should be incorporated into family doctor contracting services, chronic disease

management, and follow-up services. This enables the continuous updating of service content and the sustained advancement of elderly health management quality.

7.3.4 Coordination capability: facilitating interdepartmental collaboration to build a new service paradigm

Primary medical and health care institutions should utilize family doctor contracting services as the institutional hub for establishing internal multidisciplinary teams for elderly health management. They should fully leverage the role of family doctor teams, integrate programs such as long-term care insurance and basic public health services into contracting service packages, systematically analyze health records to formulate health management plans, and conduct follow-up services effectively. Performance allocation should be tilted toward elderly health management services to stimulate the initiative of family doctor teams. Relying on information platforms, these institutions should co-establish green referral and remote consultation channels with upper-level hospitals, upgrading the health management service paradigm from traditional one-time diagnosis and treatment to full-process health management. A quality improvement closed loop centered on the satisfaction of contracted elderly people should be established to enhance service efficiency by ensuring continuity and coordination in elderly health management.

7.3.5 Digital construction: strengthening the elderly's active health capability via informatization

It is essential to strengthen elder's ability to use information technology and establish a new paradigm of active health management. Primary medical and health care institutions should proactively advance informational training to enhance the elder's proficiency in using health-related mobile applications (apps). These institutions should regularly offer digital skills training courses, inviting professionals to elaborate on the usage of digital health tools for the elderly-with a focus on strengthening their ability to operate hardware such as smartphones and smart wearable devices. Enhancing the elder's digital literacy through these measures will not only improve their participation and satisfaction in health management but also drive the digital transformation of elderly health management services in primary medical and health care institutions, providing the elderly with a more convenient and efficient service experience.

7.4 Framework for strategies to enhance the elderly health management service capability of primary medical and health care institutions

To systematically address the current challenges faced by primary medical and health care institutions in elderly health management services, such as diversified needs, uneven resource allocation, and quality disparities, this research, based on the survey results of service providers and recipients, focuses on the core theme of "Research on Paths to Enhance the Elderly Health Management Service Capability of Primary Medical and Health Care Institutions". By comprehensively applying the Service Quality Gap Model, TQM Theory, and Dynamic Capability Theory, it constructs the following systematic enhancement strategy framework (see Table 7.1). From the three levels of macro, meso, and micro, the framework outlines a systematic advancement plan for consolidating service foundations. Integrating the four dynamic capability dimensions-sensing, learning, integration, and coordination-it proposes core strategies for optimizing service responses. Meanwhile, combined with digital construction, it points out the innovative direction for improving the quality of health management services. Together, these elements delineate a comprehensive, collaborative, and sustainable path for enhancing service capability in elderly health management within primary medical and health care institutions.

Table 7.1 Framework for improving the service pathways of health management for the elderly in basic medical and health institutions

Level-1 category	Level-2 category	Core content
Overview	Enhancement Goals	To systematically strengthen the health management service capability for the elderly in primary institutions by defining improvement pathways across macro, meso, and micro levels, thereby fostering high-quality development.
	Core Scope	Encompasses macro-level resource allocation, meso-level technical support, and micro-level service delivery. It is grounded in dynamic capabilities theory-targeting sensing, learning, integrating, and coordinating competencies-and is coupled with accelerated digital transformation.
Macro-level	Resource Optimization	Combine fiscal subsidies, age-friendly facility upgrades, and specialized personnel training / recruitment to enhance overall service quality. Utilize initiatives like the "High-Quality Service at the Grassroots Level" to channel resources and catalyze innovation in elderly care models.
	Quality Monitoring	Establish dedicated agencies for evaluation and supervision, ensure regular public disclosure of assessment results, and facilitate timely policy adjustments based on evaluation outcomes.
Meso-level	Collaborative Governance	Establish an inter-agency collaboration mechanism: Health authorities lead in developing unified content and technical standards; civil affairs provides the master database of the elderly; public

Level-1 category	Level-2 category	Core content
		security shares real-time address changes; community grid management incorporates health education into officer performance metrics-creating a cross-sector protocol based on clear responsibilities, data sharing, and indicator-driven assessment.
	Technical Support	Health bureaus organize ongoing training for primary-care staff; academic experts provide regular lectures and case discussions; online coaching and remote CME offer continuous technical support and foster cross-institutional knowledge exchange.
	Health Education	Scale up health education through TV, radio, internet, and other channels, delivering regular campaigns in diverse formats.
Micro-level	Sensing Capability	Conduct structured, assessment-centered visits; form information-sharing networks with community organizations; employ health-risk prediction models for proactive identification of health needs. Enhance staff training in geriatrics and establish multidisciplinary seminars. Develop targeted interventions via dedicated tracking, process optimization, and dynamic service updates.
	Learning Capability	Conduct monthly case-based learning sessions. Collaborate with universities and higher-level hospitals via a "industry-university-research-training" network to offer geriatric courses. Promptly introduce new knowledge and tools; utilize internal training and skills drills to absorb external knowledge, supported by case seminars and targeted learning.
	Integration Capability	Upon receiving new equipment, protocols, or funds, develop context-specific measures through case-based training and process adaptation. Conduct knowledge and skills training, build a shared repository for geriatric tools and guidelines, and integrate new service modules (e.g., integrated care, internet-based nursing) into existing contracts and management programs.
	Coordination Capability	Use family doctor contracts as the core mechanism to establish internal multidisciplinary teams, create performance incentives focused on high-risk elderly, co-build referral/consultation channels with higher-level hospitals, and form alliances with community stakeholders.
	Digital Enablement	Strengthen the capability of community volunteers to assist the elderly in using health apps. Institutions should run regular digital literacy courses focused on smartphones and wearables, empowering the elderly to manage their health through information technology.
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Chapter 8: Conclusions, Contributions, Limitations, and Future Research

Based on theoretical foundations and practical research, this research focuses on the theme of "Paths to Enhance the Elderly Health Management Service Capability of Primary Medical and Health Care Institutions" and conducts explorations in aspects including theoretical foundations, current situation surveys, evaluation index systems, empirical research, and countermeasure research, yielding several research outcomes. Building on a summary of the key research conclusions, this chapter will analyze the shortcomings and limitations of the research, and proposed" prospects and provide references for future research on the elderly health management service capability of primary medical and health care institutions, thereby offering insights for research in relevant fields.

8.1 Research findings

Based on a mixed-methods research approach (including quantitative surveys, expert consultations, and semi-structured interviews), this research conducted a systematic evaluation of elderly health management services in primary medical and health care institutions. It constructed a scientific and operable service capability evaluation system, and identified the key issues in current service provision as well as the optimization paths. The key research conclusions are listed below.

8.1.1 A health management service pathway of "demand identification-policy response-utilization promotion" has been established

To investigate the current state of supply and demand and identify key gaps in health management services for older adults at the primary care level, this study, based on findings from field surveys, proposes a pathway for elderly health management services within primary healthcare institutions structured around "Demand Identification Policy Response-Utilization Facilitation." This pathway not only elucidates the practical experience of implementing elderly health management services in Shenzhen but also provides a referential framework for other regions to optimize their own elderly health management services.

The research findings indicate that elderly health management services in Shenzhen exhibit the characteristics of high demand and high satisfaction. Specifically, 90.7% of the elderly explicitly expressed a need for health management services, such as free physical examinations. This proportion is significantly higher than the national average (approximately 75%), reflecting the effective promotion and implementation of primary healthcare policies in Shenzhen. In addition, 97.7% of the elderly reported satisfaction with the services provided by community health centers, and this satisfaction level far exceeds the national average satisfaction with primary healthcare services. These results demonstrate that the series of policy measures adopted by Shenzhen in primary healthcare services-including family doctor contracting services and the "15-minute health service circle"-have not only effectively improved the accessibility and utilization rate of health management services among the elderly but also significantly enhanced their satisfaction with community health center services. This provides valuable experience and insights for other regions, confirming that optimizing primary healthcare service models and strengthening policy support can effectively improve the health status and quality of life of the elderly.

Factors such as self-rated health, health literacy, and enrollment in family doctor contracting services collectively influence the elder's service needs, utilization behaviors, and satisfaction levels. This reveals the diversity and complexity of the influencing mechanisms underlying the elder's health management service behaviors, providing a crucial basis for understanding the current state of primary medical and health care services and establishing a practical starting point for developing a Bao'an-specific pathway to enhance the capability of health management services for the elderly.

8.1.2 A scientifically grounded multi-dimensional assessment tool for evaluating elderly health management capabilities has been developed

To develop a comprehensive evaluation index system for the service capability of elderly health management at the primary care level, this study employed the Delphi method to conduct expert consultations, successfully establishing a multidimensional evaluation index system comprising four first-level indicators, nine second-level indicators, and forty-five third-level indicators. The system demonstrates strong reliability and validity, with expert consultation results indicating high authority and consensus. Empirical investigations conducted in two community health centers in Shenzhen further confirmed its scientific rigor and applicability. This evaluation system not only enables systematic assessment of the current state of elderly health management service capability but also effectively identifies strengths and weaknesses

in the provision of such services by primary healthcare institutions. It thus provides a scientific tool for the standardized evaluation and continuous improvement of elderly health management service capability.

8.1.3 Constructing a "demand-contract-supply" ternary interactive model

To explore the influencing factors of service capability and propose systematic enhancement pathways, this study innovatively constructed a triadic interaction model of "Demand-Contract-Supply" based on the research findings, systematically elucidates the intrinsic mechanism of supply-demand matching in elderly health management services within primary healthcare institutions. By integrating remote medical resources into the family doctor contract system, the model establishes a service cycle of "screening-follow-up-referral," thereby promoting the development of a tiered and categorized precision service model. The findings demonstrate that by enhancing age-friendly adaptations, optimizing resource allocation, and fostering service coordination, a transition from a "supply-driven" to a "demand-responsive" service paradigm can be achieved. This transformation effectively improves the accessibility, alignment, and satisfaction of primary healthcare services, providing both systematic theoretical support and a practical framework for advancing China's elderly health service system.

Through an analysis of the current status of elderly health management services at the primary level in Shenzhen, this study has achieved the following three core outcomes: First, a practical pathway for primary elderly health management services, structured as "demand identification-policy response-utilization promotion," has been established. This pathway elucidates the characteristics of high demand and high satisfaction regarding health management services among the elderly in Shenzhen's Bao'an District. Second, a multidimensional evaluation tool for assessing the capability of elderly health management services has been developed. This tool provides a scientific basis for the standardized evaluation and continuous improvement of service capabilities. Third, an innovative tripartite interaction model of "demand–contract–supply" has been proposed. This model facilitates a shift in primary healthcare services from a "supply-driven" to a "demand-responsive" approach at the institutional level, offering both theoretical support and practical guidance for establishing a sustainable elderly health service system. Collectively, these outcomes form a comprehensive research framework that encompasses service pathways, evaluation tools, and institutional innovation. This framework holds significant reference value for enhancing the quality of elderly health management.

8.2 Research innovations

8.2.1 Theoretical innovations

The "Demand-Contract-Supply" ternary interactive model provides a new theoretical framework and practical pathway for improving China's aging health service system. This research systematically analyzes the elderly health management service capability of primary medical and health care institutions from three dimensions.

(1) Demand dimension: Focusing on the elderly population, it conducts an in-depth analysis of the characteristics of their health management service needs and participation behaviors.

(2) Contract dimension: With family doctor contracting services as the core, it explores the commitment and performance mechanisms of health management services.

(3) Supply dimension: It examines the service provision capability and resource allocation of primary medical and health care institutions for elderly health management.

By revealing the dynamic interactive relationship among the three, the model offers solutions for more precise and personalized health management services, which holds significant theoretical innovation value and practical guiding significance.

8.2.2 Research tool innovations

This research constructed an evaluation index system for the elderly health management service capability of primary medical and health care institutions based on the Delphi method. This system effectively quantifies the capabilities of primary medical and health care institutions in four dimensions: functional tasks, resource allocation, content and level of elderly health management services, and comprehensive management, thereby providing solid data support for the targeted improvement of health management services.

8.2.3 Perspective innovations

This research adopts a health management perspective, integrating the Service Quality Gap Model, TQM Theory, and Dynamic Capability Theory with elderly health management services in primary medical and health care institutions. The research topic features interdisciplinary attributes and management relevance, which helps expand new perspectives for studies on elderly health management services in primary medical and health care institutions.

8.3 Theoretical contributions

8.3.1 Enriching and refining the theoretical system of the elderly health management

The existing theoretical frameworks of geriatric health management primarily focus on three key areas: macro-policy analysis, research on population aging trends, and clinical management of chronic diseases. However, these mainstream theories are insufficient in addressing the critical demand of enhancing the service provision capability of primary medical and health care institutions. This research innovatively adopts a demand-driven perspective to systematically examine the operational frameworks and service supply mechanisms of primary medical and health care institutions in geriatric health management. By conducting an in-depth analysis of the dynamic interactive relationship between healthcare service providers and the elderly population, it strives to construct an innovative system that bridges theory and practice-integrating both comprehensive evaluation indicators and a universally applicable improvement model. This targeted effort fills the research gap in the capability building of primary healthcare. The research conclusions can provide theoretical references for policymakers and health administrators, and hold significant enlightening value for improving the accessibility and quality of geriatric health services at the community level.

8.3.2 Promoting interdisciplinary theoretical integration and innovation

This research represents a significant interdisciplinary exploration integrating multiple fields such as public health, geriatric medicine, and health management.The interdisciplinary theoretical integration achieved by this research holds prominent value both in academic research and practical application. By breaking down traditional disciplinary barriers, the research not only expands the analytical framework of conventional healthcare management theories but also establishes innovative conceptual perspectives and methodological tools for subsequent research in related fields. This creative integration of diverse theoretical perspectives lays a theoretical foundation for constructing holistic solutions to healthcare service improvement in the context of population aging.

8.3.3 Constructing an evaluation index system applicable to primary medical and health care institutions

This research aims to establish a demand-oriented evaluation index system for the elderly health management service capability of primary medical and health care institutions, and develop an

enhancement pathway based on this system. This pathway is not only applicable to the specific practices in Bao'an District but also possesses high promotional value, as it can provide theoretical support and practical references for other regions in the process of developing elderly health management services. Through empirical analysis, this research can offer practical evidence for formulating more scientific and rational elderly health management policies in the future, thereby facilitating the overall improvement of the service capability of primary medical and health care institutions.

8.4 Practical contributions

8.4.1 Enhancing the quality of primary healthcare services

Enhancing the quality of primary healthcare services to meet the health needs of the elderly. As a special population group, the elderly have diverse and personalized needs for health management. Currently, primary medical and health care institutions still have significant room for improvement in terms of service capability, technology application, and informatization level. This study provides an in-depth understanding of the problems and deficiencies in elderly health management services at primary healthcare institutions in Bao'an District. It offers a measurement tool for enhancing the health management service capacity of these primary institutions, provides targeted improvement suggestions for medical organizations, optimizes service processes, and improves service response speed and precision. Consequently, it better meets the health needs of the elderly and enhances their quality of life.

8.4.2 Offering a reference for decision-making

Offering a reference for decision-making to support the government in formulating policies. Based on a demand-oriented research approach, this research can truthfully reflect the actual operational status and existing problems of primary medical and health care institutions in elderly health management. The research findings and theoretical model can not only provide directions for the internal improvement of primary medical and health care institutions but also offer empirical evidence for local governments to formulate and optimize relevant policies. By enhancing service capabilities, optimizing resource allocation, and strengthening inter-departmental collaboration, the effective implementation of policies such as "hierarchical medical diagnosis and treatment" and "family doctor contracting services" can be further promoted. This, in turn, alleviates the consultation pressure on large hospitals and improves the

operational efficiency of the overall medical and health service system.

8.4.3 Promoting the application of smart healthcare

This research, while revealing the current status and existing problems, also concentrates on the application of informational development in elderly health management. By investigating the practical application of telemedicine, electronic health records, intelligent diagnosis, and other technologies in primary medical and health care institutions, it proposes specific pathways for information integration and process reengineering, thereby providing practical cases for the promotion of smart healthcare technologies. This not only helps enhance the service capability of primary medical and health care institutions but also drives the transformation of the entire community healthcare service model toward digitalization and intelligentization, offering technical support for achieving precision in health management.

8.4.4 Innovating institutional management models

This research promotes the innovation of management models in primary medical and health care institutions. The existing primary healthcare service models face issues such as talent loss and service homogeneity when responding to the challenges of population aging. Based on a demand-oriented research approach, this research can provide a new perspective for innovating the management models of primary medical and health care institutions. By constructing an evaluation index system and an enhancement pathway model, it facilitates systematic reforms in primary medical and health care institutions regarding resource allocation, personnel training, and process optimization. This enables the development of a competitive health management service system with regional characteristics, thereby offering replicable experience and models for other similar regions.

8.5 Limitations

8.5.1 The representativeness of the study subjects needs to be further improved

This research employs a cross-sectional survey method, selecting community health centers in Bao'an District, Shenzhen as the research sites. While this selection demonstrates a certain degree of representativeness, the sheer number of primary healthcare institutions across regions, coupled with significant variations in the levels and types of institutions, presents challenges.

The research sample may not comprehensively cover all categories of primary healthcare institutions, which could potentially limit the generalizability of the findings.

8.5.2 The applicability of the evaluation indicator system requires further validation

Based on the constructed evaluation index system, this study developed an assessment questionnaire for the elderly health management service capability of primary healthcare institutions. Empirical research was conducted in community health centers, verifying the operability of the evaluation index system. Although medical personnel have been surveyed, it is still necessary to expand the sample size for in-depth research to further validate the applicability of the evaluation index system.

8.6 Future research

8.6.1 Refine research methodology and data analysis techniques

To address the limitations of quantitative analysis in this study, future research could focus on methodological innovation. Artificial intelligence and big data technologies could be introduced to extensively and efficiently screen and reduce the dimensionality of potential influencing factors using algorithms such as random forests, thereby constructing more robust models. Additionally, greater emphasis could be placed on the integrative analysis of qualitative data-for example, by employing intelligent text mining and topic modeling techniques to conduct in-depth analysis of textual materials such as interviews and open-ended questionnaires. This would help extract latent themes and deep-seated needs that may not be fully captured by predefined indicators. Through such a mixed-methods research paradigm that combines quantitative and qualitative approaches with human-machine collaboration, a more comprehensive and multidimensional understanding of elderly health management service behaviors can be achieved.

8.6.2 Optimize the evaluation of the promotion and application of the assessment indicator system

To ensure the scientific validity and generalizability of the evaluation indicator system developed in this study, future research could focus on validating its external validity and predictive capability. This could involve conducting large-scale longitudinal application studies across different regions and tiers of healthcare institutions. Through follow-up surveys,

empirical analyses could be performed to examine the dynamic relationship between scores derived from the evaluation indicator system and objective health outcomes as well as subjective quality-of-life assessments of the elderly, thereby verifying the system's evaluative effectiveness. Additionally, advanced machine learning algorithms could be employed to dynamically optimize and recalibrate indicator weights based on large-sample data, addressing the subjective limitations inherent in traditional expert weighting methods. This approach would help construct a more objective, accurate, and intelligent evaluation model.

8.6.3 Exploring indicator innovation in the context of digital transformation

Under the dual national initiatives of "Healthy China" and the digital economy development, future research could increasingly focus on aligning health assessment systems with digital transformation. Specifically, in terms of evaluation content, indicators reflecting seniors' digital service capabilities-such as "usage of smart health devices (e.g., fitness trackers)"-could be incorporated. Such metrics would enable a more accurate understanding of how older adults engage with health services in the digital era. Regarding methodology, the development of automated assessment tools could be explored. This would shift evaluation approaches from traditional "posthoc summarization" toward "real-time monitoring," thereby allowing administrative bodies to identify issues and implement adjustments more swiftly.

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Annex A: Questionnaire on Health Management Services for the Elderly in Primary Healthcare Institutions

Dear Resident,

This questionnaire aims to support the development of elderly health management services in Shenzhen's primary healthcare institutions. By understanding community-dwelling elders' needs and utilization patterns, we seek to enhance service provision.

Please select the option that most accurately reflects your personal situation or opinion for each item.

We assure you that all data collected will be used exclusively for academic research. Your personal information will be kept strictly confidential.

Thank you for your valuable time and cooperation. We wish you the best of health.

The Research Team

I. Basic information

1. Your ID number is: _____

2. Your gender is:

A.Male B.Female

3. Your date of birth:_____

4. What is your highest level of education?

A. No formal education B. Primary school C. Junior high school

D. High school / Technical school / Vocational school E. College degree or above

5. What is your marital status?

A. Unmarried B. Married C. Divorced D. Widowed

6. What is your current living arrangement?

A. Living alone B. Living with spouse/partner only

C. Living with child(ren) only D. Living with both spouse and child(ren)

E. Living with other relatives or non-relatives F. Other (please specify): _____

7. Your neighborhood type is:

A. Community B. Urban Village (a specific urban community type)

C. Other (please specify): _____

8.Which street in Bao'an District do you currently reside on? _____

9. What is your registered residence (Hukou) location?

A. Bao'an District, Shenzhen

B. Other districts of Shenzhen → (Please skip to Question 11)

C. Other cities in Guangdong Province → (Please skip to Question 11)

D. Other provinces → (Please skip to Question 11)

10.How long have you been living in Bao'an District, Shenzhen?

A. Less than 6 months B. 6 months to 1 year

C. 1 to 3 years D. 3 years or more

II. Demand Patterns, Service Utilization, and Satisfaction with Elderly Health Management Services

11. How would you describe your current health status?

A. Very good B. Good C. Fair D. Poor E. Very poor

12.Which of the following best describes your personal view of health?

A. A state of complete physical and mental well-being, free from illness.

B. Absence of pain or discomfort, not requiring medical attention.

C. Experiencing discomfort, but without a diagnosed medical problem.

13.Have you been diagnosed with any of the following chronic conditions? (Select all that apply)

☐ A. Hypertension

☐ B. Hyperlipidemia

☐ C. Diabetes

☐ D. Chronic gastritis / Gastric ulcer

☐ E. Coronary heart disease

☐ F. Chronic obstructive pulmonary disease

☐ G. Chronic kidney disease

☐ H. Other heart conditions (e.g., arrhythmia)

☐ I. Gout

☐ J. Osteoporosis

☐ K. None of the above

☐ L. Other (please specify): _____

14. What types of health education have you received from the Community Health Center?

(Select all that apply)

☐ A. None

☐ B. Dietary guidance

☐ C. Traditional Chinese Medicine (TCM) health guidance

☐ D. Assessment of unhealthy lifestyle behaviors

☐ E. Chronic disease management and intervention methods

☐ F. Psychological health guidance

☐ G. Exercise guidance

☐ H. Other (please specify): _____

15.Are you aware that the Community Health Center provides elderly health management services (e.g., free physical examinations for the elderly)?

A. Yes B. No

16. How would you describe your need for the elderly health management services provided by the Community Health Center?

A. I do not need these services.

B. I am indifferent.

C. I need these services.

17. What factors affect your use of the elderly health management services (e.g., free physical examinations) at the Community Health Center? (Select all that apply)

A. Lack of time B. Perceived lack of usefulness / No desired programs

C. Poor attitude of staff D. Economic constraints

E. Unclear service information / Services not offered

F. Other (please specify): _____

18.If the Community Health Center offers the following services, which would you be willing to participate in? (Select all that apply)

A. Dietary and nutritional guidance

B. Health examination

C. Traditional Chinese Medicine (TCM) health care

D. Assessment of health risk factors

E. Chronic disease management and intervention

F. Psychological counseling and support

G. Exercise guidance

H. Other (please specify): _____

19. Which factors are most important to you when choosing a healthcare provider? (Please select up to 3)

A. Professional qualifications of staff

B. Wide range of services offered

C. Proximity to residence

D. Staff's enthusiastic attitude

E. Staff's professional competence

F. Complete inspection and testing equipment

G. Other (please specify): _____

20.Have you participated in health education activities organized by the community or Community Health Center?

A. Yes, I have participated → (Skip to Q21)

B. No, but I was aware of them → (Continue to Q20.1)

C. No, I was not aware of any activities → (Skip to Q21)

20.1 What are the reasons for not participating? (Select all that apply)

A. Not interested in the activity themes

B. Venue is too far from home

C. No small gifts provided

D. Lack of time

E. Poor staff service

F. Other (please specify): _____

21.What should the health management services provided by the Community Health Center include? (Please select up to 3)

A. Sub-health intervention

B. Acupuncture and moxibustion physiotherapy

C. Massage

D. TCM regimen

E. Common disease diagnosis and treatment

F. Chronic disease management

G. Basic physical examination

H. Convenience pharmacy

I. Other (please specify): _____

22.Overall, how satisfied are you with the nearby Community Health Center?

A. Very satisfied B. Satisfied C. Neutral

D. Dissatisfied E. Very dissatisfied F. Not applicable / No experience

23.Have you signed a contract with a family doctor?

A. Yes B. No

24.When experiencing minor health issues (e.g., a cold), which medical institution do you prefer to visit?

A. Public general hospitals

B. Primary Healthcare Institutions (e.g., community health centers)

C. Private clinics

D. Self-medication (purchasing drugs from a pharmacy)

III. Survey on the Quality of Elderly Health Management Services

25.The medical examination and testing equipment (e.g., Ultrasound, ECG machine, blood pressure monitor, blood glucose meter) at the CHC is fully equipped.

A. Strongly agree B. Agree C. Neutral

D. Disagree E. Strongly disagree

26.The examination reports provided by the CHC are accurate and reliable.

A. Strongly agree B. Agree C. Neutral

D. Disagree E. Strongly disagree

27.Are you satisfied with the physical environment and facilities of the CHC?

A. Very satisfied B. Satisfied C. Neutral

D. Dissatisfied E. Very dissatisfied

28.The CHC provides prompt service with minimal waiting time.

A. Strongly agree B. Agree C. Neutral

D. Disagree E. Strongly disagree

29.The diagnosis, treatment, and health plans provided by the CHC are medically appropriate.

A. Strongly agree B. Agree C. Neutral

D. Disagree E. Strongly disagree

30.The doctors/nurses at the CHC maintain the confidentiality of my health information and medical records.

A. Strongly agree B. Agree C. Neutral

D. Disagree E. Strongly disagree

31.When you visit the CHC, do the doctors/nurses respond to your health inquiries promptly?

A. Strongly agree B. Agree C. Neutral

D. Disagree E. Strongly disagree

32. When you encounter difficulties (e.g., with fees, printing reports), are the CHC staff helpful in resolving them?

A. Very satisfied B. Satisfied C. Neutral

D. Dissatisfied E. Very dissatisfied

33.The doctors at the CHC provide useful health education prior to consultations.

A. Strongly agree B. Agree C. Neutral

D. Disagree E. Strongly disagree

34. Are you satisfied with the accuracy of health assessments and disease diagnoses made by the CHC doctors?

A. Very satisfied B. Satisfied C. Neutral

D. Dissatisfied E. Very dissatisfied

35.How often do the doctors/nurses at the Community Health Center provide health follow-up and guidance after consultation, adjusting the healthcare plan as needed?

A. Always B. Often C. Sometimes

D. Rarely E. Never

36.How often do the doctors/nurses at the Community Health Center provide TCM services such as constitution identification and health guidance?

A. Always B. Often C. Sometimes

D. Rarely E. Never

37.How would you rate the professional skill level of the doctors/nurses at the Community Health Center?

A. Excellent B. Good C. Fair

D. Poor E. Very poor

38.Has the doctor/nurse at the Community Health Center clearly explained your medical condition, examination results, and health plan to you?

A. Always B. Often C. Sometimes

D. Rarely E. Never

39.Does the doctor/nurse at the Community Health Center develop personalized health service plans based on your condition?

A. Always B. Often C. Sometimes

D. Rarely E. Never

40. How often do the doctors/nurses at the Community Health Center actively communicate

with you to understand your health needs?

A. Always B. Often C. Sometimes

D. Rarely E. Never

41.How reasonable are the diagnosis and treatment fees at the Community Health Center?

A. Very reasonable B. Reasonable C. Neutral

D. Unreasonable E. Very unreasonable

42.What other elderly health management services do you think the Community Health Center should provide? (e.g., basic medical care, public health services, psychosocial support)

_____

43.What do you think are the main shortcomings of the Community Health Center in providing health management services for the elderly?

_____

44.What suggestions do you have for improving the elderly health management services provided by the Community Health Center?

_____

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Annex B: The First Round of Expert Inquiry Questionnaire

Development of an Evaluation Index System for Elderly Health Management Service Capability in Primary Healthcare Institutions

Expert Consultation Questionnaire (First Round)

Dear Expert,

We are writing to sincerely thank you for taking the time to participate in this expert consultation amidst your busy schedule.

China is currently facing significant challenges, including an accelerating aging population, a rising prevalence of chronic diseases, and increasing healthcare costs. In this context, the development of elderly health management services within primary healthcare institutions must adapt to the demands of the era. There is a pressing need to clarify the role of these institutions in elderly health management, leverage their unique advantages, and enhance their capability to lead in elderly healthcare and the maintenance of healthy aging. This effort is crucial for achieving the national strategic goals of "Healthy China" and "Healthy Aging." However, primary healthcare institutions currently face issues such as an unbalanced allocation of public service resources and insufficient service capability. The mismatch between the growing medical and health needs of the elderly and the available healthcare resources requires urgent resolution. Our research group aims to address the gap between the health management capabilities of primary healthcare institutions and the escalating healthcare demands of the elderly population. The goal is to develop a reference framework for enhancing the health management service capabilities of these institutions. To this end, it is essential to establish a scientifically sound evaluation index system tailored to the elderly health management services provided by primary healthcare institutions. Such a system will enable a clearer assessment of the current state of elderly health management, identify areas for improvement, and lay the groundwork for targeted capability-building efforts, thereby fostering the advancement of elderly health management services in China.

Given your distinguished expertise and accomplishments in this field, we cordially invite you to serve as a consulting expert for this study. Your insights will provide a critical foundation for our research and will significantly contribute to the refinement of the indicator system. This study strictly adheres to the principles of voluntariness and confidentiality.

To ensure the progress of our research, we kindly request that you complete the questionnaire item by item at your earliest convenience. Your responses and ratings are of utmost importance to the success of this study. We would be immensely grateful if you could return the completed questionnaire within one week. Any comments or suggestions you may have regarding this research are highly appreciated.

Thank you for your invaluable support!

Sincerely!

Contact information:

Contacts: Dr. Chen or Dr. Liang TEL: +86 13509696336; +86 18819746404

E-mail:18819746404@163.com

一. Expert Background Information

1. Name: _____

2. Age:

① <30 years old ② 30-39 years old ③ 40-49 years old ④ 50-59 years old ⑤ ≥ 60 years old

3. Highest Academic Qualification:

① Doctoral degree

② Master's degree

③ Bachelor's degree

4. Current Affiliation:

① University/Academic institution

② Healthcare institution

③ Research institute

④ Other (please specify): _____

5. Professional Title:

① Senior

② Associate senior

③ Intermediate

6. Primary Professional Field(s) and Years of Relevant Experience (please list up to two main fields):

Field 1: _____ Years of experience: _____

Field 2: _____ Years of experience: _____

7. Your overall familiarity with the subject matter of this study:

① Very familiar

② Quite familiar

③ Moderately familiar

④ Slightly familiar

⑤ Not familiar

8. Basis and Degree of Influence on Your Judgment

Judgment Criteria	Degree of Influence on Expert Judgment		
	High Influence	Moderate Influence	Low Influence
Theoretical Analysis			

Practical Experience
Review of Domestic and International Literature
Professional Intuition

Note: Please reflect on the primary basis for your judgments in this evaluation. For each factor listed above, indicate the degree of its influence on your responses by placing a "✓" in the appropriate column (one selection required per row).

二. **Consultation Form for the Construction of an Evaluation Index System for Elderly Health Management Service Capability in Primary Healthcare Institutions**

【Instructions for Completion】

1.Framework Basis: The construction of this evaluation index system integrates findings from on-site surveys of elderly residents' demand for health management services, references the index systems of nationally recognized model community health service centers, and adduces technical specifications for elderly health management. This integration is structured around the six dimensions of the SERVQUAL Model: Tangibles, Reliability, Responsiveness, Assurance, Empathy, and Cost-Effectiveness. You are requested to evaluate the importance of each indicator listed in the subsequent table.

2.Indicator Evaluation: Through extensive team discussion, a preliminary evaluation tool has been developed, comprising 3 foundational elements, 4 first-level indicators, 9 second-level indicators, and 45 third-level indicators. Please assess the importance of each indicator using the following scale:5 = Very Important, 4 = Important, 3 = Moderately Important, 2 = Slightly Important, 1 = Not Important.

3.Feedback and Suggestions: If you have suggestions for modifying any existing indicator, please note them in the designated "Modification Suggestions" column. If you believe an important indicator is missing, please propose it in the "Additional Indicators" section at the end of the form, and assign it an importance rating. Please feel free to add extra pages if more space is required for your comments

4.Scoring Context: For your reference in considering relative importance, the tentative total score for the entire "Evaluation Index System for Elderly Health Management Service Capability in Primary Healthcare Institutions" is projected to be 400 points. The final score allocated to each specific indicator will be determined by calculating weights based on the collective expert ratings from this consultation round.

Please ensure all sections are completed to facilitate a comprehensive analysis. Your thorough and thoughtful input is crucial to the success of this study, and we sincerely appreciate your valuable time and expertise.

Table 1 Consultation Form for Foundational Elements of the Evaluation Index System for Elderly Health Management Service Capability in Primary Healthcare Institutions

Foundational Elements	Element Connotation	Importance Rating					Modification Suggestions
		5 Very Important	4 Important	3 Moderately Important	2 Slightly Importan	1 Not Important	
1.Institutional Designation	The institution is officially designated and licensed as a "Primary Healthcare Institution" (e.g., Community Health Center, Community Health Station).						
2.Medical Safety Record	No medical incidents classified as Level II or above, for which the institution was deemed primarily responsible, have occurred in the previous or current year.						
3.Organizational Integrity	The institution demonstrates sound organizational management, with no practices of leasing or contracting out internal departments to external entities.						
4.Additional Elements							

Table 2. Consultation Form for First-Level Indicators of the Evaluation Index System for Elderly Health Management Service Capability in Primary Healthcare Institutions

First-Level Indicator	Indicator Connotation	Importance Rating					Modification Suggestions
		Very Important	Important	Moderately Important	Slightly Important	Not Important	
I-1.Infrastructure & Facilities (Tangibles)	Refers to the adequacy and completeness of physical facilities, equipment, and materials provided by the primary healthcare institution to support service delivery.						
I-2.Service Dependability (Reliability)	The ability of the primary healthcare institution to perform the promised elderly health management service dependably and accurately.						
I-3.Service Responsiveness & Assurance (Responsiveness, Assurance)	The willingness and ability to provide prompt, confident, and knowledgeable health management services to the elderly, inspiring trust and credibility.						
I-4.Cost Management & Perceived Value(Cost-Effectiveness)	Refers to the reasonableness of fees for health management services and the level of elderly satisfaction relative to the cost incurred.						
Supplementary Indicators							

Table 3 Consultation Form for Second-Level Indicators of the Evaluation Index System for Elderly Health Management Service Capability in Primary Healthcare Institutions

First-Level Indicator	Second-Level Indicator	Indicators Connotation	Importance Rating					Modification Suggestions
			Very Important	Important	Moderately Important	Slightly Important	Not Important	
I-1.Infrastructure & Facilities (Tangibles)	II-1.Facility Configuration	Completeness and appropriateness of basic functional areas and physical infrastructure						
	Supplementary Indicators							
I-2.Service Dependability(Reliability)	II-2.Departmental Structure	Establishment and organization of specialized clinical departments for elderly care						
	II-3.Equipment Configuration	Availability and adequacy of medical equipment for elderly services						
	II-4.Staffing Configuration	Sufficiency and composition of medical staff for elderly health management						
	Supplementary Indicators							
I-3.Service Responsiveness & Assurance (Responsiveness, Assurance)	II-5.Service Commitment	Institutional dedication and proactive approach to elderly health management						
	II-6.Service Content	Breadth and appropriateness of health management programs for elderly						
	II-7.Service Standards	Level of professionalism and adherence to quality standards in service delivery						
	Supplementary							

	Indicators		
I-4.Cost Management & Perceived Value(Cost-Effectiveness)	II-8. Cost Rationality	Transparency and reasonableness of fee structures and insurance integration	
	II-9. Elderly Satisfaction	Overall satisfaction level of elderly clients with services received	
	Supplementary Indicators		

Table 4 Consultation Form for Third Level Indicators of Evaluation Index System for Elderly Health Management Service Capability in Grassroots Medical and Health Institution

First-Level Indicators	Second-Level Indicators	Third-Level Indicators	Indicators Connotation	Importance Rating					Modif-ication Suggest-ions
				Very Important	Important	Moderately Important	Slightly Important	Not Important	
I-1. Infrastructure & Facilities (Tangibles)	II-1. Facility Configuration	III-1.Basic Medical Services	Provision of outpatient, emergency, and first-aid services across general practice and TCM departments						
		III-2.Public Health Services	Delivery of health education, vaccination, and infectious disease management						
		III-3.Health Manageme-nt Services	Comprehensive health risk management for elderly and chronic disease patients						
		III-4.Teaching & Training	Conducting educational programs for other primary healthcare institutions						
		Supplement-ary Indicators							
I-2. Service Dependability(Reliabil-ity)	II-2. Departme-ntal Structure	III-5.Clinical Department Setup	Establishment of essential clinical departments with adequate space allocation						
		III-	Dedicated spaces for elderly						

First-Level Indicators	Second-Level Indicators	Third-Level Indicators	Indicators Connotation	Importance Rating					Modif-ication Suggest-ions
				Very Important	Important	Moderately Important	Slightly Important	Not Important	
		6.Specialized Geriatric Departments	health management and specialized care						
		Supplementary Indicators							
		III-7.Building Area Compliance	Adequate facility size meeting population-based standards						
		III-8.Bed Configuration	Appropriate allocation of observation and inpatient beds						
		III-9.TCM Service Equipment	Availability of traditional Chinese medicine diagnostic and treatment equipment						
	II-3. Equipmen-t Configura tion	III-10.Screening Tools	Hearing, vision, and psychological/behavioral assessment instruments						
		III-11.Diagnostic Equipment	Comprehensive medical imaging and laboratory analysis equipment						
		III-12.Advanced Medical Devices	Ventilators, remote monitoring, and portable medical equipment						
		III-13.Sanitary Facilities	Adequate and hygienic restroom facilities with automatic controls						
		III-14.Barrier-Free Access	Comprehensive accessibility features meeting national standards						
		III-15.Privacy Protection	Measures to ensure patient confidentiality and dignity						

First-Level Indicators	Second-Level Indicators	Third-Level Indicators	Indicators Connotation	Importance Rating					Modif-ication Suggest-ions
				Very Important	Important	Moderately Important	Slightly Important	Not Important	
		III-16.Warning signs	There are clear warning signs in areas that require warning						
		III-17.Waiting chair setup	The number of waiting chairs is appropriate and the comfort level is good						
		III-18.Comfortable environmental facilities	Necessary heating and cooling equipment						
		III-19.Triage layout	The layout of the pre examination triage area and outpatient department is scientific and reasonable, with orderly, coherent, and convenient processes						
		Supplementary Indicators							
		III-20.Staff Allocation	Adequate physician, public health, and nursing staff ratios						
	II-4. Staffing Configuration	III-21.Professional Qualifications	Appropriate credentialing of all health technical staff						
		III-22.Senior Staff Availability	Presence of experienced physicians and nurses with advanced qualifications						
		Supplementary Indicators							
I-3. Service Responsiveness & Assurance	II-5. Service Commitment	III-23.Charging method	There is a manual service window for charging, with cash reserved for charging. Smart devices are equipped						

First-Level Indicators	Second-Level Indicators	Third-Level Indicators	Indicators Connotation	Importance Rating					Modif-ication Suggest-ions
				Very Important	Important	Moderately Important	Slightly Important	Not Important	
(Responsiv-eness, Assurance)			with manual duty to provide assistance to the elderly						
		III-24.Convenient service	Provide priority medical treatment and referral services for the elderly						
		III-25.Appointment method	Provide multi-channel appointments, such as phone, internet, on-site appointments, ., to provide smooth medical channels for the elderly. Volunteers provide guidance, companionship and consultation services for the elderly						
		III-26.Information terminals are aging friendly	Make aging friendly improvements to institutional information terminals, apps., to facilitate elderly people's reading and operation						
		Supplementary Indicators							
	II-6. Service Content	III-27.Medication guidance	Provide assessment, consultation, and guidance services for elderly people on multiple medications						
		III-28.Health status assessment	Assess and intervene in various health conditions such as geriatric syndrome, frailty, disability, and dementia patients						
		III-29.Short	We can provide home hospital						

First-Level Indicators	Second-Level Indicators	Third-Level Indicators	Indicators Connotation	Importance Rating					Modif-ication Suggest-ions
				Very Important	Important	Moderately Important	Slightly Important	Not Important	
		distance service	beds, visits, and other on-site services for elderly people living at home and nursing homes within our jurisdiction, as well as provide one click calling and other services						
		III-30.Therapeutic services	Provide health care, palliative care and other services for elderly people in need within the jurisdiction						
		III-31.Basic inspection and evaluation	Provide physical and auxiliary examinations to the elderly to assess their lifestyle and health status						
		III-32.Family doctor services	Standardize the implementation of family doctor contract services for the elderly, with a contract signing rate of 70% for the elderly in the jurisdiction						
		III-33.Health management services	Standardize the provision of health management services for the elderly, with a health management rate of 65% for the elderly in the jurisdiction						
		III-34.Health record creation	Establish health records for the elderly, one file per person. Compare, analyze and summarize the health examination results of elderly people over the years, propose						

First-Level Indicators	Second-Level Indicators	Third-Level Indicators	Indicators Connotation	Importance Rating					Modif-ication Suggest-ions
				Very Important	Important	Moderately Important	Slightly Important	Not Important	
			improvement measures, and form a rectification report						
		III-35.Follow up service	Interpretation of annual health examination results for the elderly and provision of daily life health guidance, and follow-up services for the elderly						
		III-36.Chronic disease guidance	Provide chronic disease prevention guidance and treatment services to the elderly						
		III-37.Traditional Chinese Medicine Health Care	Provide Chinese medicine health care services to the elderly, and carry out more than six kinds of Chinese medicine services, including Chinese medicine, acupuncture and moxibustion, massage, cupping, application, scraping, fumigation, acupoint injection, hot ironing, guidance						
		III-38.Promotion of Traditional Chinese Medicine Knowledge	Distribute traditional Chinese medicine or integrated traditional Chinese and Western medicine health education prescriptions and educational materials, promote traditional Chinese medicine disease prevention and health knowledge, and provide no						

First-Level Indicators	Second-Level Indicators	Third-Level Indicators	Indicators Connotation	Importance Rating					Modif-ication Suggest-ions
				Very Important	Important	Moderately Important	Slightly Important	Not Important	
			less than 6 traditional Chinese medicine health education prescriptions per year						
		III-39.Traditional Chinese Medicine Guidance for Chronic Disease Health Care	Carry out TCM prevention and health care services for more than two common chronic diseases (hypertension, diabetes .) for the elderly						
		III-40.Traditional Chinese Medicine Rehabilitation	More than 2 kinds of rehabilitation work such as stroke sequelae and limb disabilities are carried out by using traditional Chinese medicine, acupuncture and moxibustion, massage, fumigation and other methods						
		Supplementary Indicators							
	II-7. Service Standards	III-41.Health management service rate	The health management service rate for the elderly meets the national target requirements						
		III-42.Traditional Chinese Medicine Health Management	Standardize the development of traditional Chinese medicine health management services for the elderly, with a traditional Chinese medicine health management rate of						

First-Level Indicators	Second-Level Indicators	Third-Level Indicators	Indicators Connotation	Importance Rating					Modif-ication Suggest-ions
				Very Important	Important	Moderately Important	Slightly Important	Not Important	
		Rate Supplementary Indicators	70% for the elderly						
I-4. Cost Management & Perceived Value(Cost Effectiveness)	II-8.Cost justification	III-43.Charging system	Develop the management measures and implementation rules for medical insurance in this institution, as well as the fee system, establish an internal management system for the use of medical security funds, and assign specialized departments or personnel to be responsible for the management of the use of medical security funds						
		III-44.Execution environment	Strictly implement the medical insurance agreement, provide reasonable diagnosis and treatment, reasonable fees, and strictly adhere to the catalog of medical insurance drugs, medical consumables, and medical service items						
		Supplementary Indicators							
	II-9.Satisfac-tion rate of elderly services	III-45. Satisfaction Rate Supplementary Indicators	Percentage of elderly patients satisfied with services						

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Annex C: The Second Round of Expert Inquiry Questionnaire

Development of an Evaluation Index System for Elderly Health Management Service Capability in Primary Healthcare Institutions

Expert Consultation Questionnaire (Second Round)

Dear Expert,

We extend our sincere gratitude for the valuable time and insightful contributions you have made to our research project. Thanks to your active participation, the first round of expert consultation has been successfully completed. Many experts not only completed the questionnaires with great care but also provided constructive suggestions for the refinement of the indicator system.After thoroughly reviewing and incorporating your feedback, and through comprehensive discussions that integrated the perspectives of all participating experts, we have revised the initial set of indicators. These revisions include adjustments, additions, and deletions, resulting in the development of this second-round consultation questionnaire.

This round serves as a supplementary and improved phase of the consultation process. We kindly request that you reassess the indicators based on the consolidated feedback from the first round and provide your responses accordingly. Please evaluate the importance of each indicator at all levels included in the attached tables.

To ensure the progress of this study, we would greatly appreciate it if you could complete and return the questionnaire within one week.

Thank you again for your significant contribution to this research.

Sincerely!

Contact information:

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E-mail:18819746404@163.com

I. Expert Background Information

1.Name: _____

II. Consultation Form for the Construction of the Evaluation Index System for Elderly Health Management Service Capability in Primary Healthcare Institutions

【Instructions for Completion】

1. Framework Basis: This evaluation index system integrates on-site survey results of elderly residents' demands for health management services, references the National Demonstration Community Health Service Center Index System and the Technical Specifications for Elderly Health Management, and is structured around the six dimensions of the SERVQUAL Model: Tangibility, Reliability, Responsiveness, Assurance, Empathy, and Cost-Effectiveness. You are requested to evaluate the importance of each indicator in the attached tables.

2. Indicator Evaluation: A preliminary evaluation tool has been developed through extensive research team discussions. It comprises 3 foundational elements, 4 first-level indicators, 9 second-level indicators, and 45 third-level indicators. Please assess the importance of each indicator using the following scale: 5 = Very Important, 4 = Important, 3 = Moderately Important, 2 = Slightly Important, 1 = Not Important.

3. IFeedback and Suggestions: If you have suggestions for modifying any existing indicators, please note them in the designated "Modification Suggestions" column. If you believe an important indicator is missing, please propose it in the "Additional Indicators" section and assign it an importance rating. Please add extra pages if more space is required for your comments..

4. Scoring Context: For your reference in considering relative importance, the tentative total score for the entire evaluation system is projected to be 400 points. The final score allocated to each indicator will be determined by calculating weights based on the collective expert ratings from this consultation round.

Note: Please reflect on the primary basis for your judgments in this evaluation. For each factor listed above, indicate the degree of its influence on your responses by placing a "✓" in the appropriate column (one selection required per row).

Table 1 Consultation Form for Foundational Elements of the Evaluation Index System for Elderly Health Management Service Capability in Primary Healthcare Institutions

Foundational Elements	Element Connotation	Importance Rating					Modification Suggestions
		Very Important	Important	Moderately Important	Slightly Important	Not Important	
1.Institutional Designation	The institution is officially designated and licensed as a "Primary Healthcare Institution" (e.g., Community Health Service Center).						
2.Medical Safety Record	No medical incidents classified as Level II or above, for which the institution was deemed primarily responsible, have occurred in the previous or current year.						
3.Organizational Integrity	The institution demonstrates sound organizational management, with no practices of leasing or contracting out internal departments to external entities.						
Supplementary Indicators							

Table 2 Consultation Form for First-Level Indicators of the Evaluation Index System for Elderly Health Management Service Capability in Primary Healthcare Institutions

First-Level Indicators	Indicators Connotation	Importance Rating					Modification Suggestions
		Very Important	Important	Moderately Important	Slightly Important	Not Important	
I-1. Infrastructure & Facilities (Tangibles)	Refers to the adequacy and completeness of physical facilities, equipment, and materials provided by the primary healthcare institution to support service delivery.						
I-2. Service Dependability(Reliability)	The ability of the primary healthcare institution to perform the promised elderly health management service dependably and accurately.						
I-3. Service Responsiveness & Assurance(Responsiveness, Assurance)	The willingness and ability to provide prompt, confident, and knowledgeable health management services to the elderly, inspiring trust and credibility.						
I-4. Cost Management & Perceived Value(Cost-Effectiveness)	Refers to the reasonableness of fees for health management services and the level of elderly satisfaction relative to the cost incurred.						
Supplementary Indicators							

Table 3 Consultation Form for Secondary Indicators of Evaluation Index System for Elderly Health Management Service Capability in Primary Healthcare Institutions

First-Level Indicators	Second-Level Indicators	Indicators Connotation	Importance Rating					Modification Suggestions
			Very Important	Important	Moderately Important	Slightly Important	Not Important	
I-1. Infrastructure & Facilities (Tangibles)	II-1..Basic Functions	Basic functional settings of primary healthcare institutions						
	Supplementary Indicators							
I-2.Service Dependability(Reliability)	II-2.Department Settings	Classification of diagnosis and treatment departments in primary healthcare institutions						
	II-3.Device config	Equipment configuration for serving the elderly in primary healthcare institutions						
	II-4.Staffing	Medical staff and other facilities in primary healthcare institutions						
	Supplementary Indicators							
I-3.Service Responsiveness & Assurance(Responsiveness, Assurance)	II-5.Willingness to provide health management services	Awareness of providing health management services for the elderly in primary healthcare institutions						
	II-6.Ability to provide health management services	The content of health management services provided by primary healthcare institutions for the elderly						
	II-7.Service Level	The level of health management for the elderly in primary healthcare institutions						
	Supplementary Indicators							
I-4. Cost Management & Perceived Value(Cost-	II-8.Cost justification	Rationality of medical insurance and fees in primary healthcare institution						
	II-9.Satisfaction rate of elderly services	Elderly people's satisfaction with the services provided by primary healthcare institutions						

First-Level Indicators	Second-Level Indicators	Indicators Connotation	Importance Rating					Modification Suggestions
			Very Important	Important	Moderately Important	Slightly Important	Not Important	
Effectiveness)	Supplementary Indicators							

Table 4 Consultation Form for Third Level Indicators of Evaluation Index System for Elderly Health Management Service Capability in Grassroots Medical and Health Institution

First-Level Indicators	Second-Level Indicators	Third-Level Indicators	Indicators Connotation	Importance Rating					Modification Suggestions
				Very Important	Important	Moderately Important	Slightly Important	Not Important	
I-1.Functiona-l tasks (tangibility)	II-1.Basic function	III-1.Basic medical services	Provide basic medical services, carry out outpatient services and laboratory examination services in general practice, traditional Chinese medicine and other subjects, as well as emergency and first aid services, and be able to make preliminary diagnosis and emergency treatment for common critically ill patients						
		III-2.Public health services	The delivery of public health services and the implementation of activities encompassing health education, prevention vaccination, and the reporting and management of infectious diseases and public health						

First-Level Indicators	Second-Level Indicators	Third-Level Indicators	Indicators Connotation	Importance Rating					Modification Suggestions
				Very Important	Important	Moderately Important	Slightly Important	Not Important	
			emergencies.						
		III-3.Health management services	Provide health management services, and carry out comprehensive and continuous health management on the health risk factors of resident residents in the area, especially the elderly aged 60 and above, patients with chronic diseases such as hypertension and type 2 diabetes, to maintain or promote health						
		III-4.Other services	Undertake health education lectures for the elderly at least twice a year						
		Supplementa-ry Indicators							
I-2.Resource allocation (tangibility)	II-2.Departm-ent Settings	III-5.Departmen-t Settings	Set up general clinic, traditional Chinese medicine clinic, rehabilitation treatment clinic, traditional Chinese massage, emergency room, pre examination triage room/fever checkpoint. Determine the number of clinical departments and their usage area based on the number of service population to meet the construction standards of						

First-Level Indicators	Second-Level Indicators	Third-Level Indicators	Indicators Connotation	Importance Rating					Modification Suggestions
				Very Important	Important	Moderately Important	Slightly Important	Not Important	
			community health service centers and stations						
		III-6.Special department settings	Independently establish elderly health management departments, fever clinics, dental clinics, rehabilitation departments						
		Supplementa-ry Indicators							
		III-7.Building area	Building area, meeting the standard for business housing area based on the number of service population						
		III-8.Bed setting	Bed configuration, reasonably allocated according to service scope and population, with at least 5 daytime observation beds or inpatient beds, actual open beds						
	II-3.Device config	III-9.Traditional Chinese Medicine Service Equipment	According to the Notice on Issuing the Basic Standards for Urban Community Health Service Centers and Stations, relevant equipment should be equipped and necessary traditional Chinese medicine service equipment should be provided						
		III-10.Screening	Equipped with hearing screening tools, vision						

First-Level Indicators	Second-Level Indicators	Third-Level Indicators	Indicators Connotation	Importance Rating					Modification Suggestions
				Very Important	Important	Moderately Important	Slightly Important	Not Important	
		tool settings	screening tools, and psychological and behavioral screening tools						
		III-11.Other equipment	Equipped with other equipment that matches the diagnosis and treatment subjects						
		III-12.Inspect equipment	Equipped with air disinfection machine DR, Ultrasound, fully automatic biochemical analyzer, coagulation analyzer, twelve lead electrocardiogram machine, electrocardiogram monitor, dynamic blood pressure monitor, biosafety cabinet. Equipped with a certain number of portable medical equipment and transportation vehicles that provide information technology, as well as ventilators, remote electrocardiogram monitoring equipment and instruments						
		III-13.Sanitary facilities	The layout of sanitary toilets is reasonable, and non manual switches should be used for the washbasin and other facilities in the bathroom						
		III-14.Barrier-	The accessible facilities meet the requirements of relevant						

First-Level Indicators	Second-Level Indicators	Third-Level Indicators	Indicators Connotation	Importance Rating					Modification Suggestions
				Very Important	Important	Moderately Important	Slightly Important	Not Important	
		free facilities	standards. The first floor of medical facilities should be equipped with accessible toilets. Elevators or accessible ramps should be installed on the second floor, and elevators should be installed on the third floor and above						
		III-15.Privacy protection facilities	Outpatient consultation rooms, treatment rooms, multi person wards, and other areas provide necessary privacy protection measures for service recipients						
		III-16.Warning signs	There are clear warning signs in areas that require warning						
		III-17.Waiting chair setup	The number of waiting chairs is appropriate and the comfort level is good						
		III-18.Comfort-able environmental facilities	Necessary heating and cooling equipment						
		III-19.Triage layout	The layout of the pre examination triage area and outpatient department is scientific and reasonable, with orderly, coherent, and convenient processes						
		III-	Health education bulletin						

First-Level Indicators	Second-Level Indicators	Third-Level Indicators	Indicators Connotation	Importance Rating					Modification Suggestions
				Very Important	Important	Moderately Important	Slightly Important	Not Important	
		20.Promotio-n and Display Supplementa-ry Indicators	boards, exhibition stands, electronic screens, and intelligent interactive devices						
		III-21.Basic medical staff allocation	The scope of practice includes clinical and traditional Chinese medicine practitioners (assistant) in general practice with a population of 3, public health physicians with a population of 1, registered nurses with a population of 3, and regular volunteer duty						
	II-4.Staffing	III-22.Qualificat-ion of medical staff	Health technicians possess qualifications suitable for their positions						
		III-23.Personnel with intermediate and senior professional titles	The center should have at least one practicing physician with associate senior or higher qualifications, at least one practicing physician in the traditional Chinese medicine category with intermediate or higher qualifications, one practicing physician in public health with intermediate or higher qualifications, and one						

First-Level Indicators	Second-Level Indicators	Third-Level Indicators	Indicators Connotation	Importance Rating					Modification Suggestions
				Very Important	Important	Moderately Important	Slightly Important	Not Important	
			registered nurse with intermediate or higher qualifications						
		Supplementa-ry Indicators							
		III-24.Charging method	There is a manual service window for charging, with cash reserved for charging. Smart devices are equipped with manual duty to provide assistance to the elderly						
I-3.Content and level of elderly health managemen-t services (reliability, responsiven-ess, assurance, and empathy)	II-5.Willingn-ess to provide health manageme-nt services for the elderly	III-25.Convenie-nt service	Provide priority medical treatment and referral services for the elderly						
		III-26.Appoint-ment method	Provide multi-channel appointments, such as phone, internet, on-site appointments, to provide smooth medical channels for the elderly. Volunteers provide guidance, companionship and consultation services for the elderly						
		III-27.Informati-on terminals are aging friendly	Make aging friendly improvements to institutional information terminals, apps, to facilitate elderly people's reading and operation						
		Supplementa-ry							

First-Level Indicators	Second-Level Indicators	Third-Level Indicators	Indicators Connotation	Importance Rating					Modification Suggestions
				Very Important	Important	Moderately Important	Slightly Important	Not Important	
		Indicators							
		III-28.Medication guidance	Provide assessment, consultation, and guidance services for elderly people on multiple medications						
		III-29.Health status assessment	Assess and intervene in various health conditions such as geriatric syndrome, frailty, disability, and dementia patients						
	II-6.Ability to provide health management services	III-30.Short distance service	We can provide home hospital beds, visits, and other on-site services for elderly people living at home and nursing homes within our jurisdiction, as well as provide one click calling and other services						
		III-31.Therapeu-tic services	Provide health care, palliative care and other services for elderly people in need within the jurisdiction						
		III-32.Basic inspection and evaluation	Provide physical and auxiliary examinations to the elderly to assess their lifestyle and health status						
		III-33.Health record creation	Establish health records for the elderly, one file per person. Compare, analyze and summarize the health examination results of elderly people over the years, propose						

First-Level Indicators	Second-Level Indicators	Third-Level Indicators	Indicators Connotation	Importance Rating					Modification Suggestions
				Very Important	Important	Moderately Important	Slightly Important	Not Important	
			improvement measures, and form a rectification report						
		III-34.Follow up service	Interpretation of annual health examination results for the elderly and provision of daily life health guidance, and follow-up services for the elderly						
		III-35.Chronic disease guidance	Provide chronic disease prevention guidance and treatment services to the elderly						
		III-36.Tradition-al Chinese Medicine Health Care	Provide Chinese medicine health care services to the elderly, and carry out more than six kinds of Chinese medicine services, including Chinese medicine, acupuncture and moxibustion, massage, cupping, application, scraping, fumigation, acupoint injection, hot ironing, guidance						
		III-37.Promotio-n of Traditional Chinese Medicine Knowledge	Distribute traditional Chinese medicine or integrated traditional Chinese and Western medicine health education prescriptions and educational materials, promote traditional Chinese medicine disease prevention and health						

First-Level Indicators	Second-Level Indicators	Third-Level Indicators	Indicators Connotation	Importance Rating					Modification Suggestions
				Very Important	Important	Moderately Important	Slightly Important	Not Important	
			knowledge, and provide no less than 6 traditional Chinese medicine health education prescriptions per year						
		III-38.Traditional Chinese Medicine Guidance for Chronic Disease Health Care	Carry out TCM prevention and health care services for more than two common chronic diseases (hypertension, diabetes.) for the elderly						
		III-39.Tradition-al chinese medicine rehabilitatio-n	More than 2 kinds of rehabilitation work such as stroke sequelae and limb disabilities are carried out by using traditional Chinese medicine, acupuncture and moxibustion, massage, fumigation and other methods						
		Supplementa-ry Indicators							
	II-7.Service Level	III-40.Health management service rate	The health management service rate for the elderly has reached the national target requirements, and the health management rate for the elderly in the jurisdiction has reached 65%						
		III-	Standardize the						

First-Level Indicators	Second-Level Indicators	Third-Level Indicators	Indicators Connotation	Importance Rating					Modification Suggestions
				Very Important	Important	Moderately Important	Slightly Important	Not Important	
		41.Family doctor services	implementation of family doctor contract services for the elderly, with a contract signing rate of 70% for the elderly in the jurisdiction						
		III-42.Traditional Chinese Medicine Health Management Rate Supplementary Indicators	Standardize the development of traditional Chinese medicine health management services for the elderly, with a traditional Chinese medicine health management rate of 70% for the elderly						
I-4.Comprehe-nsive managemen	II-8.Cost justificatio-n	III-43.Charging system	Develop the management measures and implementation rules for medical insurance in this institution, as well as the fee system, establish an internal management system for the use of medical security funds, and assign specialized departments or personnel to be responsible for the management of the use of medical security funds						
		III-44.Executio-n environment	Strictly implement the medical insurance agreement, provide reasonable diagnosis and treatment, reasonable fees, and strictly adhere to the catalog of						

First-Level Indicators	Second-Level Indicators	Third-Level Indicators	Indicators Connotation	Importance Rating					Modification Suggestions
				Very Important	Important	Moderately Important	Slightly Important	Not Important	
			medical insurance drugs, medical consumables, and medical service items						
		Supplementa-ry Indicators							
	II-9.Satisfacti-on rate of elderly services	III-45.Service satisfaction rate	Satisfaction rate=number of respondents who are satisfied with the overall survey/total number of respondents multiplied by 100%						
		Supplementa-ry Indicators							

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Annex D: Assessment Form for Health Management Service Capability of Elderly People in Primary Heaithcare and Medical Institutions

Evaluated Unit:

Assessment Form for Health Management Service Capability of Elderly People in Grassroots Medical Institutions

Basic conditions				
Inspection items		Inspection content	Inspection results	
Institution name		The name of the occupational license for medical institutions is primary health and medical institutions (such as community service centers)	□Meet the requirements □Not Satisfiable	
Medical safety		There have been no medical accidents identified as Level 2 or above with primary responsibility in the previous year or the current year	□Meet the requirements □Not Satisfiable	
Organizational management		No behavior of renting out or contracting internal departments to external parties	□Meet the requirements □Not Satisfiable	
Specific indicators				
First level indicators	Secondary indicators	Third level indicators	Score	Note
Functional tasks (100 points)	Basic function (100 points)	1.Provide basic medical services, carry out outpatient services and laboratory examination services in general practice, traditional Chinese medicine and other subjects, as well as emergency and first aid services, and be able to make preliminary diagnosis and emergency treatment for common critically ill patients (27 points)		
		2.Providing public health services, including health education, vaccination, reporting and handling of infectious diseases and sudden public health emergencies (26 points)		
		3.Provide health management services, and carry out		

		comprehensive and continuous health management on the health risk factors of resident residents in the area, especially the elderly aged 60 and above, patients with chronic diseases such as hypertension and type 2 diabetes, to achieve the purpose of maintaining or promoting health (27 points)		
		4.Undertake at least 2 health education lectures for the elderly per year (20 points)		
Resource allocation (101 points)	Department Settings (33 points)	5.Set up general clinic, traditional Chinese medicine clinic, rehabilitation treatment clinic, traditional Chinese massage, emergency room, pre examination triage room/fever checkpoint. Determine the number of clinical departments based on the number of service population to meet the "Construction Standards for Community Health Service Centers and Stations" (17 points)		
		6.Independently set up elderly health management departments, fever clinics, dental departments, rehabilitation departments. (16 points)		
	Device config (35 points)	7.Building area, meeting the standard for business housing area based on the number of service population (3 points)		
		8.Bed configuration, reasonably allocated based on service scope and population, with at least 5 daytime observation beds or inpatient beds, actual open beds (2 points)		
		9.According to the Notice on Issuing the Basic Standards for Urban Community Health Service Centers and Stations, it is required to equip relevant equipment and necessary traditional Chinese medicine service equipment (3 points)		
		10.Equipped with hearing screening tools, vision screening tools, and psychological and behavioral screening tools (2 points)		
		11.Equipped with other equipment		

		that matches the diagnosis and treatment subjects (2 points)		
		12.Equipped with air disinfection machine DR, Ultrasound, fully automatic biochemical analyzer, coagulation analyzer, twelve lead electrocardiogram machine, electrocardiogram monitor, dynamic blood pressure monitor, biosafety cabinet. Equipped with a certain number of portable consultation equipment and transportation vehicles that provide information technology, as well as ventilators, remote electrocardiogram monitoring equipment and instruments (3 points)		
		13.The layout of sanitary toilets is reasonable, and non manual switches should be used for the washbasin in the bathroom (2 points)		
		14.The accessible facilities meet the requirements of relevant standards. The first floor of medical facilities should be equipped with accessible toilets. When the number of floors is two, elevators or accessible ramps should be installed, and elevators should be installed for floors three and above (3 points)		
		15.Provide necessary privacy protection measures for service recipients in areas such as outpatient consultation rooms, treatment rooms, and multi person wards (3 points)		
		16.There are clear warning signs in areas that require warning (3 points)		
		17.The number of waiting chairs is appropriate and the comfort level is good(2 points)		
		18.Necessary heating and cooling equipment (3 points)		
		19.The pre examination triage and outpatient layout is scientific and reasonable, with orderly, coherent, and convenient processes (3 points)		
		20.Health education bulletin		

		boards, exhibition stands, electronic screens, and intelligent interactive devices. (2 points)		
	Staffing (34 points)	21.The scope of practice includes clinical and traditional Chinese medicine practitioners (assistant) in general practice, with 3 physicians per 10000 population, public health physicians per 10000 population, registered nurses per 3 population, and regular duty volunteers (11 points)		
		22.Health technicians possess qualifications suitable for their positions (12 points)		
		23.The center must have at least one practicing physician with associate senior or higher qualifications, at least one practicing physician with intermediate or higher qualifications in traditional Chinese medicine, one practicing physician with intermediate or higher qualifications in public health, and one registered nurse with intermediate or higher qualifications (11 points)		
Content and level of health management services for the elderly (105 points)	Willingness to provide health management services (36 points)	24.There is a manual service window for charging, and cash charges are retained. Intelligent devices equipped with manual monitoring to provide assistance to the elderly (12 points)		
		25.Provide priority medical treatment and referral services for the elderly (12 points)		
		26.Provide multi-channel appointments, such as phone, internet, on-site appointments., to provide smooth medical channels for the elderly. Volunteers provide guidance, companionship consultation and other services for the elderly (12 points)		
	Ability to provide health management services(33 points)	27.Make aging friendly improvements to institutional information terminals, apps. to facilitate elderly people's reading and operation (2 points)		
		28.Provide assessment, consultation, and guidance services for elderly people on		

		multiple medications (2 points)		
		29.Ability to assess and intervene in various health conditions such as geriatric syndrome, frailty, disability, and dementia patients (3 points)		
		30.Being able to provide home hospital beds, visits, and other on-site services for elderly people living at home and nursing homes within the jurisdiction, as well as providing one click call and other services (3 points)		
		31.Provide health care, palliative care and other services for elderly people in need within the jurisdiction (2 points)		
		32.Provide physical examination and auxiliary examination to the elderly, evaluate their lifestyle and health status (3 points)		
		33.Establish health records for the elderly, one file per person. Compare, analyze and summarize the health examination results of elderly people over the years, propose improvement measures, and form a rectification report (3 points)		
		34.Interpretation of annual health examination results for the elderly and provision of daily life health guidance, as well as follow-up services for the elderly (3 points)		
		35.Provide chronic disease prevention guidance and treatment services to the elderly (3 points)		
		36.Provide Chinese medicine health care services to the elderly, and carry out more than 6 kinds of Chinese medicine services, including Chinese medicine, acupuncture and moxibustion, massage, cupping, application, scraping, fumigation, acupoint injection, hot ironing, and guidance (2 points)		
		37.Distribute traditional Chinese medicine or integrated traditional Chinese and Western medicine health education prescriptions and educational materials, promote traditional Chinese medicine disease prevention and health		

		knowledge, and provide no less than 6 traditional Chinese medicine health education prescriptions per year (2 points)		
		38.Chinese medicine prevention and health care services for more than two common chronic diseases (hypertension, diabetes.) for the elderly (2 points)		
		39.More than 2 kinds of rehabilitation work, such as stroke sequelae and limb disabilities, were carried out by using Chinese medicine, acupuncture and moxibustion, massage, fumigation and other methods (3 points)		
	Service level (34 points)	40.The health management service rate for the elderly has reached the national target requirements, and the health management rate for the elderly in the jurisdiction has reached 65% (11 points)		
		41.Standardize the implementation of elderly family doctor signing services, with a signing rate of 70% (12 points) for elderly people in the jurisdiction		
		42.Standardize the implementation of traditional Chinese medicine health management services for the elderly, with a traditional Chinese medicine health management rate of 70% (11 points) for the elderly		
Comprehensive management (95 points)	Reasonable cost (45 points)	43.Develop the medical insurance management measures and implementation rules, as well as the fee system for this institution, establish an internal management system for the use of medical security funds, and assign specialized departments or personnel to be responsible for the management of the use of medical security funds (22 points)		
		44.Strictly implement the medical insurance agreement, provide reasonable diagnosis and treatment, charge reasonable fees, and strictly adhere to the catalog of medical insurance drugs, medical consumables, and medical service items (23 points)		
	Satisfaction rate of elderly	45.Satisfaction rate=number of respondents who are satisfied with		

	services (50 points)	the overall survey/total number of respondents multiplied by 100% (50 points)		

Total score:
Investigators:
Investigation time: