Analysis of Influencing Factors on the Implementation of Medical-Preventive Integration Based on the Horn-Mitter Model: Postprint

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Abstract

As an important direction of China's medical and health system reform, medical-preventive integration holds significant importance for meeting the comprehensive health needs of the population. Establishing a scientific and effective medical-preventive integration model is a pressing priority. This study employs literature analysis and other methods to collect data, reviews the implementation status and challenges of China' s medical-preventive integration policy, and analyzes the factors influencing policy implementation based on the six dimensions of the Horn-Mitter model. On this basis, it proposes measures including refining policy objectives, clarifying implementation standards, enhancing resource supply, diversifying implementation approaches, exploring common interests between medical and preventive institutions, improving the "collaborative mechanism," and actively guiding implementers to deliver medical-preventive integration services, aiming to provide reference for the future high-quality improvement of medical-preventive integration services.

Full Text

Analysis of Factors Influencing the Implementation of Medical-Preventive Integration Based on the Horn-Mitter Model

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Abstract

Medical-preventive integration represents a crucial direction in China' s healthcare system reform and holds significant importance for meeting the comprehensive health needs of the population. Establishing a scientific and effective model for medical-preventive integration is therefore an urgent priority. This study employs literature analysis and other methods to collect relevant data, reviews the current implementation status and challenges of China' s medical-preventive integration policies, and analyzes the influencing factors in policy implementation based on the six dimensions of the Horn-Mitter model. Building upon this analysis, we propose several measures: refining policy objectives and clarifying implementation standards; increasing resource allocation; diversifying implementation approaches; exploring common interests between medical and preventive institutions to improve "coordination mechanisms"; and actively guiding policy implementers to deliver medical-preventive integration services. These recommendations aim to provide valuable insights for enhancing the quality of medical-preventive integration services in the future.

Keywords: Health services administration; Medical-preventive integration; Horn-Mitter model; Policy implementation; Influencing factors; Policy

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Medical-preventive integration has emerged as a concept to deepen healthcare reform, meet the growing demand for medical services, and improve population health levels. It refers to the combination of "treatment" and "prevention," integrating clinical healthcare services with preventive public health services to achieve seamless coordination and unified medical-preventive care [**?**].

1 Materials and Methods

This study employs literature review and secondary data analysis methods.

1.1 Data Sources

Data were obtained from two sources: literature materials and secondary datasets. Literature was sourced from CNKI, Wanfang Data, and VIP Chinese Journal Database, with policy documents obtained from official national government websites. For the secondary data analysis, this study extracted data on public health personnel and general practitioners from the National Health Statistics Yearbooks (2015–2022) as key indicators, given that medical-preventive integration requires the fusion of basic medical services and public health services across multiple dimensions including workforce, information,

and management, with public health personnel and general practitioners being essential elements.

1.2 Literature Search and Screening

Literature Search: Using keywords such as "medical-preventive integration," "implementation status," "barriers," "influencing factors," "dilemmas," and "problems," we conducted subject searches in CNKI, Wanfang Data, and VIP Chinese Journal Database for academic journal articles published between 2016 and 2022.

Literature Screening: Inclusion criteria were: (1) relevance to the research topic/content, and (2) Chinese-language literature. Exclusion criteria were: (1) duplicate literature across databases, (2) incomplete bibliographic records, and (3) literature without full text. A total of 770 articles were retrieved, with bibliographic records imported in EndNote format, resulting in a final library of 178 included articles. The literature library comprised three components: (1) bibliographic information, (2) factors influencing policy implementation (collecting problems, barriers, and dilemmas mentioned in the literature regarding medical-preventive integration implementation), and (3) factor categorization (organizing the identified influencing factors according to the six dimensions of the Horn-Mitter model).

Secondary Data Analysis: Descriptive analysis was used to examine indicators including the total number of general practitioners, general practitioners per 10,000 population, total public health personnel, total health technicians, and professional public health personnel per 10,000 population.

1.3 Analytical Framework

The Horn-Mitter model, proposed by American scholars Horn and Mitter, identifies six dimensions of factors influencing policy implementation: (1) **Policy objectives and standards**, where objectives represent the desired outcomes and value propositions of a policy [**?**], while standards refer to the documented regulations and operational criteria established by relevant state departments for evaluating implementation effectiveness [**?**]; (2) **Policy resources**, including human, financial, and information resources required during implementation, with richer resources strengthening implementers' motivation; (3) **Policy implementation methods**, referring to the communication and coordination interactions among implementers and between implementers and target groups, whose appropriateness affects implementation willingness; (4) **Characteristics of implementation agencies**, referring to the inherent attributes of executing organizations; (5) **System environment**, encompassing the political, economic, and socio-cultural contexts in which the policy operates; and (6) **Value orientation of policy implementers**, indicating their identification with and acceptance of the policy. These six factors interact and influence each other throughout the policy implementation process [**?**], as illustrated in [Figure 1:

see original paper].

Compared with other models, the Horn-Mitter model provides a more comprehensive framework for clarifying the various factors in policy implementation and their interrelationships, offering a structured approach for analyzing complex implementation influences. Given that medical-preventive integration policy is a top-down process with central directives and local execution—aligning with the Horn-Mitter model' s requirements—this study employs the model to analyze implementation influencing factors. Current research on medical-preventive integration remains in the practical stage, with implementation encountering various obstacles. This analysis aims to identify blind spots in the implementation process and provide references for constructing more effective medical-preventive integration mechanisms.

2 Analysis of Influencing Factors

2.1 Policy Objectives and Standards

2.1.1 Vague Policy Objectives Review of policy documents from 2016–2022 reveals that China' s medical-preventive integration policy framework is continuously improving, with the established goal of creating an integrated health management service characterized by "active prevention before illness, scientific management after illness, and continuous follow-up services." However, this represents only a qualitative overall objective without quantitative sub-targets. For instance, the "*14th Five-Year Plan" for National Health* does not specify quantitative indicators for medical-preventive integration, leaving local departments without concrete targets or references during implementation and resulting in inadequate understanding of work objectives and suboptimal policy outcomes.

2.1.2 Lack of Clear Policy Standards Currently, China' s medical-preventive integration efforts focus primarily on grassroots levels, using hypertension and diabetes as entry points. While national policies vigorously promote medical-preventive integration, review of relevant documents shows that evaluation mechanisms for implementation effectiveness remain incomplete. The "*14th Five-Year Plan*" *for National Health* acknowledges that the assessment system for medical-preventive integration is still in the exploratory stage, with no standardized, measurable operational and evaluation criteria available, making it impossible to assess the breadth and depth of integration efforts [**?**].

2.2 Policy Resources

2.2.1 Significant Shortage of General Practitioners and Public Health Personnel General practitioners and public health personnel are key elements of medical-preventive integration. Currently, a substantial shortage of general practitioners exists. As shown in , China' s total number of general practitioners increased by 262,271 from 2014 to 2021, with the number per 10,000 population

rising from 1.28 to 3.08. However, this remains far below the standard commonly required in developed countries of "at least 5 general practitioners per 10,000 population." This shortage has become a "bottleneck" constraining the development of grassroots health services, significantly impacting family doctor contract services and hindering medical-preventive integration efforts [**?**, **?**].

shows that while China' s total public health personnel and health technician numbers continue to rise, with professional public health personnel per 10,000 population reaching its lowest point in 2017 before trending upward from 2018-2021, the overall quantity remains insufficient. The *Medium- and Long-Term Health Personnel Development Plan (2011-2020)* (Wei Ren Fa [2011] No. 15) stipulated that by 2020, professional public health agency staff should reach 1.18 million, or 8.3 per 10,000 population [**?**]. Our findings indicate that 2021 data still shows a shortfall of 222,000 personnel compared to this target, with a gap of 1.51 professional public health personnel per 10,000 population.

2.2.2 Closed Information Systems Information systems remain fragmented and relatively closed, with integrated real-time communication platforms yet to be established, making it difficult to meet the full-cycle, comprehensive management service requirements of medical-preventive integration [**?**]. Research by Yu Yahang et al. [**?**] shows that in western China, the interoperability and sharing rate of electronic health records and electronic medical records in grassroots medical institutions is below 10%. The lack of whole-process management makes it difficult to access real-time health data, resulting in "information silos" that cause data redundancy and resource waste [**?**]. Furthermore, insufficient integration between medical and public health information systems, with communication relying primarily on direct network reporting systems that cannot access real-time data, prevents full utilization of synergies between medical and public health institutions during public health emergencies.

2.2.3 Inadequate Public Health Service Compensation Mechanism Financial compensation for public health services provided by both medical and preventive institutions remains low. Research shows that in 2019, approximately 17% of costs for public health services provided by hospitals and about 19% for public health agencies required self-raised funds [**?**]. This makes it difficult for financial compensation to cover public health service costs, resulting in inadequate compensation for public health work and ultimately insufficient motivation for implementation agencies to pursue medical-preventive integration [**?**].

2.2.4 Urgent Need to Improve Supporting Mechanisms On one hand, effective incentive mechanisms are lacking. Incentive mechanisms are crucial for motivating medical institutions to undertake public health services and encouraging clinical health technicians to participate in public health work. Currently, no clear national evaluation criteria for medical-preventive integration exist,

leaving substantial autonomy to regional and institutional assessment systems. Since providing clinical services generates economic benefits while public health services do not, few institutions incorporate public health services into performance incentives, affecting staff enthusiasm for public health work. On the other hand, China' s basic medical insurance "three major catalogs" emphasize reimbursement for medical expenses, with few items covering disease prevention such as physical examinations and preventive care, and various payment methods all have inherent problems that hinder medical-preventive integration [**?**].

2.3 Policy Implementation Methods

2.3.1 Administrative Command as Primary Implementation Method Review of national medical-preventive integration policy documents reveals that policies are primarily disseminated through notices in relevant documents, with top-down implementation driven by administrative orders. Systematic guidelines and comprehensive implementation plans have not been developed. State Council documents tend to be macro-level plans with limited issuance frequency, while most notices are issued by the National Health Commission. As shown in , although administrative measures can promote implementation to some extent, the lack of strong supervision mechanisms for these "work notices" often results in weak binding force during actual implementation, causing medical-preventive integration work to become formalistic and ineffective.

2.3.2 Government Overreach and Limited CDC Development Medical-preventive integration services are implemented by local governments, easily leading to implementation pitfalls. Taking Sanming City' s medical-preventive integration reform in Fujian as an example, the process—from system planning to personnel appointments—is largely constrained by government administrative systems. Due to the marginalized status of CDC institutions, which receive hierarchical professional guidance but local government administrative leadership, they lack the authority to coordinate medical and public health institutions. Excessive government intervention can create situations where "non-experts manage experts," leading to administrative rigidity and inefficiency in medical-preventive integration work [**?**].

2.4 Characteristics of Implementation Agencies and Value Orientation of Implementers

2.4.1 Task Conflicts Between Medical and Preventive Institutions Medical-preventive integration requires collaborative efforts between medical and public health institutions. However, differences in service attributes create task conflicts. Successful disease prevention reduces treatment needs, thereby decreasing revenue from treatment services. Increased medical institution business volume indicates more illness, requiring reduced investment in prevention resources. This paradoxical task conflict places medical and public health in-

stitutions in a competitive and mutually exclusive dilemma, causing medical-preventive integration outcomes to deviate from original intentions [**?**].

2.4.2 Lack of Coordination Mechanisms On one hand, organizational coordination mechanisms are inadequate. Different departments have varying understandings of medical-preventive integration concepts. The "health-centered" approach remains at the conceptual level, with professional institutions exhibiting territorial consciousness and operating independently, leading to unclear delineation of responsibilities, authority, personnel, and service scope between public health and medical service systems [**?**]. On the other hand, management mechanisms are fragmented. Integration between medical and preventive services has not been established, with chronic disease prevention and control failing to connect with treatment and rehabilitation, and infectious disease response suffering from coordination failures and delays in surveillance, reporting, and early warning [**?**].

2.4.3 Weak Awareness of Medical-Preventive Integration Among Implementers The long-standing phenomenon of "emphasizing treatment over prevention" persists throughout China' s healthcare system, from government and medical institutions to individual healthcare workers, with insufficient understanding of medical-preventive integration. National sampling surveys show that medical staff spend most of their time on daily diagnosis and routine care, with public health work becoming additional pure workload. Influenced by management institutions' treatment-focused philosophy, preventive public health services lack effective economic incentives [**?**]. Since medical services generate economic benefits while public health services show less visible impact and outcomes, medical services often occupy the core position, causing some public health services to become mere formalities and fostering a "treatment over prevention" work attitude [**?**].

2.5 System Environment

Regarding the political environment, since General Secretary Xi Jinping proposed the integration of treatment and prevention at the National Health and Wellness Conference in 2016, numerous policy documents on medical-preventive integration have been issued, providing strong political support. However, China' s medical-preventive integration policies remain fragmented, mostly appearing indirectly within other policies, lacking specialized and systematic policy documents to supervise and guide implementation work [**?**]. Economically, China' s healthcare service system development is unbalanced, with insufficient investment in public health constraining medical-preventive integration development. In the socio-cultural environment, inadequate publicity work has led to public misunderstanding of public health, with the perception that medical institutions are the primary channel for disease treatment while rarely actively participating in prevention activities.

3 Discussion and Recommendations

3.1 Refine Policy Objectives and Establish Implementation Standards

China' s medical-preventive integration is currently in the practical stage. To achieve integrated health management services, macro-level policy planning and layout are essential. Under the guidance of overall objectives, specific work targets should be refined according to key priorities and requirements of medical-preventive integration. Since national policies are broad and macroscopic, unable to account for regional realities, local implementation requires decomposing policies level by level and formulating detailed objectives based on policy spirit combined with regional population density and medical conditions, clarifying specific targets for implementation departments according to implementation phases and scope.

Establish a performance evaluation mechanism for medical-preventive integration, using grassroots doctor teams as assessment units to refine performance indicators for chronic disease management such as hypertension and type 2 diabetes. Incorporate both medical service outcomes and public health service effectiveness into the evaluation scope, establishing a health outcome and resident satisfaction-oriented assessment system. In addition to collecting routine quantitative data such as resident satisfaction scores, non-quantitative information should also be gathered to understand specific areas of dissatisfaction and improve implementation effectiveness. Evaluations should avoid a "one-size-fits-all" approach and develop performance assessment systems tailored to actual conditions.

3.2 Increase Resource Supply

General practitioners are the main providers and core of medical-preventive integration services, serving as "gatekeepers" for residents' health. It is necessary to strengthen general practitioner education, training, and job transfer programs. Develop work responsibilities and service content for medical institutions providing medical-preventive integration services, and secure greater policy support from finance, medical insurance, and human resources departments [**?**]. Public health talent constitutes the backbone of achieving universal health. We must strengthen public health workforce development, optimize training models, and cultivate high-level, interdisciplinary health professionals with composite capabilities [**?**]. In information technology, improve the national health information platform to achieve interoperability among all types of medical and public health institutions, conduct in-depth mining and analysis of residents' health data, and enhance information utilization rates and capacity. Promote the establishment of effective public health service compensation mechanisms by increasing financial investment to ensure normal operation of public health institutions while establishing health outcome-oriented medical insurance fund incentive mechanisms that provide full compensation to medical institutions undertaking public health tasks [**?**], thereby motivating medical institutions to actively engage in

preventive care and tiered diagnosis and treatment. Simultaneously, establish incentive mechanisms that reflect the value of medical workers' labor by incorporating their public health coordination work in providing medical-preventive integration services into the compensation system, adhering to the principle of "more pay for more work" and rewarding excellent performance.

3.3 Diversify Policy Implementation Methods

Employ diversified implementation methods, using administrative means as the primary approach while exploring the development of systematic and specialized guidelines for medical-preventive integration work. Utilize corresponding economic and legal instruments to strengthen supervision and inspection. The government should appropriately delegate authority and empower institutions, clarifying the functional positioning of CDCs, exploring the establishment of a vertically managed disease control system, and granting CDCs the authority to organize and coordinate medical and public health institutions within certain scopes to ensure smooth medical-preventive integration progress.

3.4 Explore Common Interests Between Medical and Preventive Institutions and Improve "Coordination Mechanisms"

The primary reason for insufficiently close cooperation between medical and public health systems is that both parties pursue their own interest maximization with inadequate cooperation motivation. First, it is necessary to properly manage the degree of integration through "incentive compatibility" theory to "bind" the interests of agents and principals at all levels [**?**] and explore common interests among policy implementation agencies. Second, the government should leverage the regulatory role of medical insurance to promote coordinated operations among institutions [**?**], improve supporting reforms of medical insurance payment methods, and enable medical and preventive institutions to jointly strive toward the goal of "providing integrated health management services for residents." Finally, improve medical-preventive "coordination mechanisms" by clarifying the functional positioning of public health and medical institutions, establishing an organizational system with consistent objectives and clearly defined rights and responsibilities, and constructing management mechanisms for chronic disease prevention and infectious disease control to provide comprehensive, full-lifecycle integrated medical services.

3.5 Actively Guide Policy Implementers to Carry Out Medical-Preventive Integration Services

First, health administrative departments should play a coordinating role, defining the work responsibilities and service content of medical institutions in providing medical-preventive integration services, and securing more policy support from finance, medical insurance, and human resources departments [**?**]. Second, clarify medical institutions' responsibilities in disease prevention by issuing documents to implement the concept of medical-preventive integration and

cultivate general practitioners capable of assuming preventive care, health management, and two-way referral functions. Third, address the weak awareness of medical-preventive integration among medical staff by strengthening professional training, enhancing learning of public health expertise, and changing the treatment-over-prevention attitude. Fourth, strengthen policy publicity using news media to create a positive public health opinion environment, improve public cognition of disease treatment and prevention, and continuously enhance residents' health literacy.

Medical-preventive integration, as an important initiative for achieving the Healthy China strategy, holds great significance for meeting people' s health needs. Currently, China' s medical-preventive integration is in the practical exploration stage, with implementation influenced by multiple factors. Based on the six dimensions of the Horn-Mitter model, this study identified issues including vague policy objectives, unclear standards, insufficient implementation resources, inadequate implementation methods, task conflicts and lack of coordination mechanisms between medical and preventive institutions, weak implementer awareness, and suboptimal system environments. Therefore, it is essential to establish and improve the medical-preventive integration service system across all dimensions, closely integrating medical and preventive services to provide full-lifecycle health management for the population.

Author Contributions: LAI Qingling was responsible for conceptualization and manuscript writing; XU Chuanchuan handled manuscript organization and proofreading; FENG Yuanyuan conducted literature and policy review; LIANG Peifeng selected the research topic; LI Yinshan was responsible for manuscript revision and overall accountability.

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Note: Figure translations are in progress. See original paper for figures.