

Research on the Construction and Application of a Practical Teaching System for Integrated Prevention and Control of Endemic and Chronic Diseases Targeting Compact County-level Medical Communities

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Abstract: In recent years, the construction of compact county-level medical communities in China has been steadily advancing, and the prevention and control of endemic and chronic diseases within this context are gradually evolving towards a continuous and comprehensive approach, posing new demands for the practical ability training of medical professionals. In response, this paper explores the practical value of integrated prevention and control of chronic diseases based on the actual needs of integrated chronic disease prevention and control within county-level medical communities, analyzes the necessary value of this prevention and control work in the teaching system of medical colleges, and proposes a practical teaching system for integrated prevention and control of chronic diseases. This system integrates the concept of integrated prevention and control of chronic diseases and the grassroots prevention and control processes into medical practical teaching, thereby providing a reference for cultivating medical professionals who meet the operational needs of county-level medical communities.

Keywords: Compact county-level medical communities; Endemic and chronic diseases; Integrated prevention and control; Medical education; Grassroots medical and health services

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1. Introduction

Compact county-level medical communities refer to three-tier medical consortia established with county-level

hospitals as the core, in conjunction with township health centers and village clinics. This model enhances the capacity of grassroots medical services, enabling the public to access high-quality medical services locally, and provides strong medical and health support for grassroots development and rural revitalization ^[1]. In 2023, the National Health Commission, the State Commission Office of Public Sector Reform, and eight other ministries and commissions jointly issued the “Guidelines on Comprehensively Promoting the Construction of Integrated County-Level Healthcare Consortia” (National Health Primary Level Development [2023] No. 41), which emphasized the policy approach of adhering to government-led efforts and scientifically establishing county-level healthcare consortia ^[2]. As China continues to advance the construction of integrated county-level healthcare consortia, the current county-level healthcare service system is gradually adopting an integrated operational model characterized by resource consolidation and the integration of medical and preventive services ^[3]. As a crucial component of the primary healthcare service system, county-level healthcare consortia serve as the primary implementation vehicle for the prevention and control of endemic and chronic diseases ^[4]. Due to factors such as changes in disease patterns and an aging population, China has long faced the coexistence of endemic and chronic diseases at the county level, which significantly impact the health and well-being of the population. The prevention and control of these diseases are challenging, characterized by long cycles, multiple stages, and high demands for continuous intervention, posing a significant test for primary prevention and control models ^[5]. Against this backdrop, an integrated prevention and control model for endemic and chronic diseases, encompassing prevention, screening, diagnosis, treatment, follow-up, and health management, is gradually emerging as a key direction for practical exploration within county-level healthcare consortia. Given this trend, medical students, as the future talent pool for primary disease prevention and control, currently lack the comprehensive skills required for primary-level endemic and chronic disease management in their practical education. Therefore, integrating this integrated prevention and control model for endemic and chronic diseases into their educational framework will help enhance their capabilities for future primary-level prevention and control efforts ^[6]. Based on this, this paper will propose a medical practice teaching system oriented towards practical ability cultivation based on the prevention and treatment needs of the integration of endemic and chronic diseases, thereby providing a reference for the effective connection between medical education and the prevention and treatment practices of county medical communities.

2. Research basis for the practice teaching system for integrated prevention and treatment of endemic and chronic diseases

2.1. Practical value of integrated prevention and treatment of endemic and chronic diseases

Endemic and chronic diseases represent the most prevalent and persistent types of health issues in primary healthcare services. Chronic diseases, in particular, often have a long course and require sustained intervention cycles. The prevention and treatment of these diseases involve not only basic medical diagnosis and treatment but also subsequent control of related causal factors, lifestyle interventions, and other aspects ^[7]. Endemic diseases, on the other hand, are closely linked to local geographical environments, climatic conditions, water sources, or soil factors, making them difficult to address through conventional medical means ^[8]. Given the long-term coexistence of endemic and chronic diseases, primary prevention and treatment face challenges such as a large number of targets, widespread service demands, and high complexity and continuity of work. In response to these issues, the integrated prevention and treatment of endemic and chronic diseases aims to strengthen the

operational relationship between medical services and public health services, reducing fragmented measures in the prevention and treatment process. Through this integration, prevention and treatment can effectively enhance the continuous management and response capabilities of primary healthcare institutions towards endemic and chronic diseases, transforming prevention and treatment work from stage-based interventions into more systematic and long-term management mechanisms, thereby improving the overall effectiveness of primary prevention and treatment of endemic and chronic diseases^[9]. Under the overall framework of the current tightly integrated county-level medical community operation, integrated prevention and treatment of endemic and chronic diseases now possess relatively realistic implementation conditions, effectively advancing the goal of extending prevention and treatment services for endemic and chronic diseases to the grassroots level.

2.2. Analysis of the necessity for constructing a medical practical teaching system under the demand for integrated prevention and treatment

The integrated prevention and treatment system for endemic and chronic diseases places demands on the capabilities of medical professionals with its comprehensive and systematic characteristics, which markedly differ from the traditional job capability structure centered on single diagnostic and treatment skills. Therefore, under the implementation of this prevention and treatment system, if medical schools continue to use existing medical practical teaching standards, students may focus more on mastering diagnostic and treatment techniques for specific diseases, while having a relatively limited understanding of the management models and operational mechanisms involved in the grassroots prevention and treatment of endemic and chronic diseases^[10]. It cannot be overlooked that this teaching model has accumulated considerable teaching experience over a long period and holds significant advantages in cultivating basic medical capabilities. However, its limitations are equally apparent when it comes to meeting the practical demands of integrated prevention and treatment of endemic and chronic diseases at the grassroots level. Therefore, with the continuous advancement of tightly integrated county-level medical communities, integrated prevention and treatment of endemic and chronic diseases at the grassroots level necessitate higher requirements for current medical talent cultivation. Medical practical teaching also requires appropriate adjustments in content setting and organizational methods. Only in this way can medical education better respond to the needs of grassroots prevention and treatment and address the limitations in cultivating the practical capabilities of medical talents.

3. Research on the construction of a practical teaching system for integrated prevention and control of endemic and chronic diseases

3.1. Principles for constructing the teaching system

Given the characteristics of integrated prevention and control of endemic and chronic diseases, such as the involvement of multiple prevention and control stages and a long practical cycle, the practical teaching system needs to differ from traditional practical teaching models. Specifically, the teaching objectives should focus on helping students acquire basic knowledge and skills related to the prevention and control of endemic and chronic diseases, and further guide them to understand the overall process and logic of integrated prevention and control, thereby fostering a systematic understanding of primary-level prevention and control practices from within.

In response to this, the practical teaching system for integrated prevention and control of endemic and chronic diseases proposed in this study adheres to the following fundamental principles:

Firstly, the principle of prevention and control demands orientation, which establishes teaching objectives and content centered around the actual operational needs of integrated prevention and control of chronic diseases.

Secondly, the principle of practical ability orientation, which leverages students' participation and experiences in real or simulated prevention and control scenarios to enhance their comprehensive practical abilities.

Thirdly, the principle of gradual progression, which incrementally increases teaching difficulty and practical depth according to students' learning stages and foundational abilities.

3.2. Design of teaching content modules

The practical teaching content is divided into four teaching modules, with each module designed to enable students to gradually develop a systematic understanding of integrated prevention and control of endemic and chronic diseases throughout the learning process.

3.2.1. Cognitive and basic practice module for integrated prevention and control of chronic diseases

As the starting point of this practical teaching system, this module aims to help students understand the fundamental concepts of integrated prevention and control of endemic and chronic diseases. The teaching will take typical case studies of endemic and chronic disease management in county-level regions as the main thread, guiding students to identify major health issues and risk factors in the management of endemic and chronic diseases based on the teacher's analysis of residents' health records, follow-up records, and basic medical information in the classroom. During the explanation, teachers will promote the concept of integrated prevention and control to students, helping them establish a basic cognitive framework for the prevention and control of endemic and chronic diseases at an overall level.

3.2.2. Process practice module for integrated prevention and control of chronic diseases

After completing the initial foundational knowledge, the teaching content will delve deeper. This module will comprehensively present the core aspects of endemic and chronic disease prevention and control, covering various stages such as prevention, screening, diagnosis, treatment, follow-up, and referral in disease prevention and control. It will also train students in their understanding and execution of the prevention and control process. During the learning process, teachers will employ a situational teaching approach, simulating students' placement in different prevention and control stages and requiring them to complete corresponding practical tasks based on given information. Additionally, to enhance the operability of the teaching, the following practical tasks will be set concurrently:

- (1) Sort out the complete process for the prevention and treatment of endemic or chronic diseases based on case data;
- (2) Develop corresponding record forms or follow-up key points at different prevention and treatment stages;
- (3) Analyze and explain potential issues that may arise during the process.

In this training, students are required to gradually master the basic operational logic of integrated prevention and treatment of chronic diseases and expand their understanding of prevention and treatment.

3.2.3. Medical prevention collaboration and team-based management practice module

In this teaching module, the focus will be on cultivating students' ability to participate in chronic disease management within a team setting. Teaching will be based on family doctor teams and primary-level chronic disease management practices, guiding students to understand the collaborative approaches and practical significance of medical services and public health services in the prevention and treatment of endemic and chronic diseases. During implementation, team simulations will be used for teaching, where students will be grouped and assigned different roles. Under the guidance of instructors, they will engage in discussions and practical activities based on predefined scenarios for managing endemic and chronic diseases.

3.2.4. Comprehensive case practice and integrated prevention and treatment plan module

The objective of this teaching content is to integrate the learning outcomes from the previous modules and guide students to complete comprehensive tasks for the integrated prevention and treatment of endemic and chronic diseases. Teaching will be conducted against the backdrop of comprehensive case management or small-scale population management scenarios, integrating all aspects of the knowledge learned in previous modules to train students in analyzing and making decisions within an overall framework. During this process, teachers will provide students with comprehensive case materials containing information on screening, diagnosis, and treatment, follow-up, and referrals, requiring them to propose a relatively complete management plan based on the analysis of existing prevention and treatment processes and explain the weak links in the prevention and treatment workflow.

3.3. Implementation path of practical teaching

In the specific implementation of the practical teaching system for the integrated prevention and treatment of endemic and chronic diseases, teaching begins with the cognitive and foundational practices of integrated prevention and treatment of endemic and chronic diseases as the starting point. At the beginning of the course, teachers provide an overall introduction to the real-world scenarios of prevention and treatment work, combining the practices of endemic and chronic disease prevention and treatment in the context of county medical consortia, allowing students to first understand the main tasks and basic knowledge of primary-level prevention and treatment of endemic and chronic diseases. Subsequently, teaching begins to revolve around the work sequence of endemic and chronic disease prevention and treatment, integrating elements such as prevention and screening, diagnosis and treatment, follow-up management, and referral coordination into the teaching process. Under the guidance of teachers, students complete practical tasks in different prevention and treatment links according to given scenarios and gradually become familiar with the basic process of integrated chronic disease prevention and treatment while training on the operational points of each link. Furthermore, the teaching begins to introduce content related to medical-prevention collaboration and team-based management. Students are organized in groups to carry out practical work around specific endemic and chronic disease management objects. In the simulated scenario of a family doctor team operation, students discuss follow-up arrangements, health education, and management priorities within the scenario and determine the division of responsibilities for different roles within the team. Finally, the prevention and control concepts, process awareness, and collaborative experience involved in the previous modules will be comprehensively applied. Based on the analysis of case materials, students are required to sort out the entire process of chronic disease prevention and control and propose corresponding management plans.

3.4. Teaching evaluation and feedback mechanism

In this practical teaching system, teaching evaluation comprises two parts: performance evaluation during the teaching process and effectiveness evaluation after the completion of teaching. The evaluation of the teaching process is integrated into various teaching links of practical teaching and is assessed based on the practical materials generated by students during the teaching process and the actual completion of tasks. The health records analyzed by students and the prevention and control processes sorted out by them during the teaching process will serve as the foundational basis for process evaluation. During this process, teachers need to review and record the materials submitted by students, assessing whether students can accurately extract key information centered around prevention and control targets, whether they can present a complete management process in accordance with the logic of endemic disease-chronic disease prevention and control, and whether they have clearly defined management priorities and follow-up arrangements in their plans. Regarding teaching effectiveness evaluation, mainly after the completion of teaching, students are required to submit a comprehensive integrated prevention and control plan for chronic diseases, and teachers will focus on checking whether the prevention and control process in the plan is complete and whether the prevention and control ideas are consistent throughout. The results of both evaluations will be combined to serve as the specific teaching effectiveness for students.

Meanwhile, a teaching feedback mechanism is established in this system. Problems identified during the teaching process will be fed back to students through classroom critiques, group discussions, and other methods, and targeted adjustments will be made in subsequent practical tasks.

4. Conclusion

The construction of a closely-knit medical consortium in county regions represents a practical endeavor undertaken by the nation in response to societal needs and evolving circumstances, and its comprehensive advantages have facilitated its continuous advancement. In light of the development of endemic and chronic diseases within county areas, the prevention and control system established under the framework of the closely-knit medical consortium in county regions imposes higher demands on the capacity of primary healthcare services and the practical competence of medical professionals. Against this backdrop, integrating the prevention and control philosophy, service procedures, and collaborative requirements for the integrated prevention and control of endemic and chronic diseases into the practical teaching at medical schools will facilitate a closer connection between medical education and primary prevention and control practices. This approach will better guide students in developing a holistic understanding of prevention and control procedures and collaborative mechanisms through continuous practice, ensuring that the content of practical teaching aligns more closely with the actual operations of medical consortia in county regions. As prevention and control models and service offerings at the primary level continue to improve in the future, there will be further room for optimization in the content and operational methods of practical teaching. Only through continuous improvement can it stably meet the practical demands posed by the integrated prevention and control of endemic and chronic diseases for the cultivation of medical professionals.

Disclosure statement

The authors declare no conflict of interest.

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