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Challenges and Pragmatic Strategies in Advancing Integrated Management of Multi-Campus Hospitals from the Perspective of Systems Theory

—A Case Study of 55 Tertiary A-Level Hospitals[1] in Chongqing

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Abstract

The integrated management of multi-campus hospitals is essential for improving contemporary hospital management systems and facilitating the modernization of governance frameworks and management skills and is necessary for achieving optimal hospital development. From a systems theory perspective, the integrated management of multi-hospital campuses should be regarded as a cohesive and unified system to attain optimization and improvement. This necessitates improving institutional supply, maximizing organizational structure coordination, and reinforcing digital technology support. This study examines 55 tertiary A-level hospitals in Chongqing to comprehensively investigate the practical problems and limitations in advancing integrated administration of multi-hospital campuses. This text examines the implementation strategy for integrated management of multi-hospital campuses via the lens of systems theory and the "institution-structure-technology" paradigm, intending to offer theoretical perspectives and practical concepts to strengthen multi-hospital campus integration.

Subject Areas

Public Health

[1]A tertiary A-level hospital represents the highest level in the hierarchical classification of hospitals in China. It is evaluated based on multiple factors, including the hospital's functionality, responsibilities, facility conditions, technological infrastructure, medical service quality, and scientific management.

Keywords

Systems Theory, Multi-Campus Hospitals, Institutional Supply, Integrated Management, Technological Empowerment

1. Introduction

As China's economy rapidly develops and urban-rural integration progresses, the demand for regional healthcare services, especially high-quality healthcare services, has been rising [1]. In this context, numerous public hospitals have demonstrated a tendency to evolve into multi-campus entities [2]. The National Health Commission of the People's Republic of China (NHCPRC) implemented the "Guidelines for the Planning of Medical Institutions (2021 - 2025)" and the "Notice on Regulating the Management of Sub-Campuses in Public Hospitals" in 2022 to regulate and enhance the quality and efficiency of development in multi-campus public hospitals[2]. These documents clearly delineate the concept, conditions, and scope of sub-campus management in public hospitals, signifying a new phase in the standardized evolution of multi-campus management inside China's public hospitals. In practice, the administration of multi-campus public hospitals is still in the experimental stage, facing numerous obstacles in management systems, policies, and methodologies. This circumstance necessitates contemplation on how to efficiently enhance the integration of multi-campus administration. As the public's desire for multi-tiered, diverse healthcare services increases, the challenge of preventing chaotic expansion while attaining integrated administration and standardized services across campuses requires thorough examination. Given this, integrating the high-quality development trend of public hospitals, the practice of multi-campus integrated management, and the developmental requirements of national governance modernization necessitates elucidating the practical logic of multi-campus integrated management, optimizing the management approach, and augmenting management efficiency. This has emerged as a significant theoretical and practical concern for party committees, governmental bodies at all levels, and various sectors of society.

2. Authentic Challenges in Multi-Campus Integrated Management

Multi-campus integrated management is an effective strategy for executing the scientific and uniform administration of multi-campus institutions. As of March 1, 2025, Chongqing has 55 tertiary hospitals. The public hospital multi-campus management model in Chongqing is distinguished by its quick development, extensive geographical coverage, and substantial capacity. Nonetheless, it encounters substantial difficulties and obstacles. According to systems theory and a prac-

[2]A multi-campus hospital refers to a hospital that, in addition to its original main campus, establishes multiple campuses in different geographical locations, each providing certain medical services. Although these campuses are situated in various locations, they all belong to the same hospital management system.

tice-oriented methodology, the challenges can be classified as institutional bottlenecks: the need to improve institutional supply; structural dilemmas: the necessity to refine structural coordination; and technological constraints: the obligation to strengthen technological empowerment.

2.1. Institutional Constraints: The Necessity for Enhanced Institutional Provision

Multi-campus integrated management necessitates an appropriate management system as a prerequisite. Nevertheless, the current institutional frameworks and changes have not yet aligned with the trend of high-quality hospital development and the demands for modernized governance. The absence of sufficient management systems has emerged as a significant institutional impediment and the integrated goal management system requires enhancement [3].

Ambiguous Development Objectives for Multi-Campus Expansion.

When formulating and implementing development objectives for multi-campus expansion, it is crucial to include both existing hospitals and prospective facilities. This often leads to an imbalance, where the goals for multi-campus development appear diverse yet fail to achieve meaningful and cohesive integration.

Unscientific Discipline Placement in Multi-Campus Institutions.

There exists a limited knowledge of discipline construction in multi-campus institutions, characterized by ambiguous concepts and an absence of competitive, distinctive, and progressive strategies in discipline growth. This leads to disparate advancement of disciplines, a deficiency of prominent fields, and a lack of unique developmental characteristics.

Lack of an Integrated Coordination and Cooperation Mechanism.

Currently, integrated multi-campus management still lacks unified institutional norms in areas such as personnel management, logistical support, and brand culture development. This leads to challenges in meeting the dynamic demands of public health and emergency management, such as epidemic prevention and control, and makes it difficult to achieve the effective expansion and decentralization of high-quality medical resources.

Incomplete Integrated Performance Evaluation System.

The continuous optimization of the performance management system is crucial for enhancing the quality of detailed operations in multi-campus management, which is a new challenge currently faced. The performance evaluation indicators for multi-campus institutions lack directionality and specificity. Due to differences in the development status of departments across campuses, the management's attention to each department varies, and performance management is often limited to performance evaluation and bonus distribution, which does not effectively reflect labor value and campus objectives, and may even disconnect from the strategic management of multi-campus institutions. For example, due to the lack of a unified evaluation system, it is difficult to ensure the fairness of performance appraisal in multi-campus hospitals. New hospitals in the initial period,

due to insufficient manpower, material resources and workload, lead to a large gap between the performance appraisal based on medical operations and that of the old hospitals, which affects the work motivation of medical staff.

2.2. Structural Dilemmas: The Need to Optimize Structural Coordination

Improving hospital efficiency, reducing management costs, promoting differentiated development, and strengthening multi-campus integrated coordination management have become essential aspects and main trends in multi-campus management [4]. Coordinating multi-campus integrated organizational collaboration to enhance management efficiency is a pressing issue that requires immediate attention. This challenge is specifically reflected in the lack of collaboration between multi-campus institutions, the lack of coordination among functional departments across campuses, and the lack of internal coordination within campuses. As a result, the integrated management operation of multi-campus institutions loses its cohesiveness, and organizational transformation lacks momentum.

There is no unified vision to form a collective effort, with different responsibilities and risks, leading to business operations primarily driven by inertia. This results in insufficient collaboration in terms of coordinating high-quality medical resources, taking proactive actions, and achieving actual collaborative effectiveness, failing to achieve the goal of collaboration and efficiency improvement. Due to the fact that many hospital leaders come from medical backgrounds, there is a lack of awareness and attention to structural management for multi-campus institutions. This leads to the absence of scientific and targeted organizational structures between campuses. Core organizational personnel, constrained by limited management capacity, must spend significant time on technical tasks while also coping with supervisory inspections from higher authorities and attending various internal and external meetings, all of which affect the quality of organizational structure management. The development of organizational structures between campuses is sluggish, with poor adaptability, making it difficult to meet the hospital's expanding scale. For example, in a large general hospital, the division of management authority is not sufficiently clear. In the decision-making process for equipment procurement, the main hospital, as the core campus, believes it should hold a certain degree of decision-making power over the procurement of equipment for the branch hospitals. However, the branch hospital prefers to independently procure equipment based on its specific needs. This ambiguity of authority led to a delay in the procurement of a new type of ultrasound diagnostic equipment for a branch hospital that was in urgent need of such equipment due to the disagreement of all parties and the repeated approval process, which affected the clinical diagnostic work of the branch hospital.

2.3. Technological Constraints: The Need to Strengthen Technological Empowerment

Hospital information construction is the foundation of multi-campus integrated

management and ensures the standardization of multi-campus medical services [5]. However, digital technology construction is not simply about adding different types of hospital information systems; it is an organic integration aimed at improving medical quality and services. In practice, digital technologies have not been effectively utilized to their full potential in supporting multi-campus integrated management.

The construction of information infrastructure urgently needs to be upgraded. On the one hand, the information systems between multi-campus institutions are outdated, and on the other hand, there is a lack of a unified information system development and application across campuses. As a result, the standardization of information connectivity is low, and data synchronization is absent. Consequently, systems can only adopt low-level, low-quality methods for sharing and interacting, which easily lead to "information silos." A study showed that different information systems are used in different hospital campuses, resulting in a lack of real-time information sharing and interconnectivity. In terms of patient information transmission, due to the incompatibility of data formats and interfaces between the two systems, the examination results from the branch hospital cannot be transmitted to the main hospital in a timely and accurate manner. As a result, when the patients visit the head campus for a follow-up consultation, the doctors need to reschedule the examinations, which increases the cost and time of medical treatment for the patients.

Besides, there is a shortage of high-level information technology talent. The healthcare industry is currently at a significant opportunity for high-quality development, aided by information technologies such as big data, cloud computing, and the Internet of Things. However, it also faces challenges in the application of innovative technologies and a lack of skilled professionals and human resources, which severely impact the intelligent management capabilities of multi-campus institutions. For example, various integrated platforms have emerged to achieve data interoperability and sharing across campuses. However, after the implementation of centralized platforms, the lack of multidisciplinary talent in hospitals has led to the inability of these platforms to maintain autonomy, user-friendliness, and the original purpose of the platform's construction.

3. The Practical Logic of Multi-Campus Integrated Management

From the perspective of systems theory, multi-campus integrated management is a logical process of interrelated system coordination, support, and integration. It is characterized by high levels of synergy, interactivity, and compatibility. Following the principles of system holism, dynamics, and structure, it evolves into a closely connected unified whole (**Figure 1**).

First, from the perspective of system holism, synergistic development refers to strengthening the mutual support within multi-campus integrated management, maintaining the overall functionality of multi-campus management, reducing contradictions and opposing factors, and ensuring coordinated development across campuses while allowing differentiated growth on the foundation of standardization.

Secondly, from the perspective of system dynamics, compatible development

refers to the coordinated allocation of multi-campus integrated management medical resources, especially high-quality medical resources.

Thirdly, from the perspective of system structure, balanced development refers to exploring the balance point within the structure of multi-campus integrated management, primarily addressing the issue of imbalanced management across campuses.

This paper studies the key issues in the integrated management of 55 tertiary A-level hospitals in Chongqing from the systems theory perspective. In terms of management methods, it aims to enhance system balance through standardized management; in terms of the management system, it seeks to improve system connectivity through collaborative management; and in terms of management technology, it strives to enhance the self-organizational capability of the system through intelligent management. This approach helps to recognize the holistic and complex nature of multi-campus integrated management and to grasp the practical direction of such management from a global perspective.

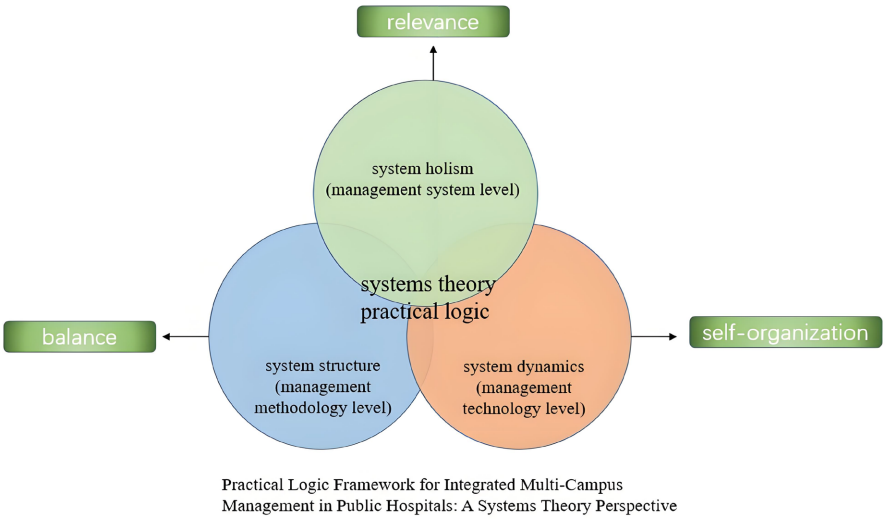

Figure 1. Practical logical framework for integrated multi-campus management in public hospitals: A systems theory perspective.

4. Methodology Adopted for the Study

Taking 55 tertiary A-level hospitals in Chongqing as an example, this study identifies the advantages and disadvantages of different multi-campus management models and summarizes successful experiences and universal patterns suitable for the integrated management of multi-campus public hospitals. Statistical methods are employed for analysis, with appropriate statistical techniques selected based on the research objectives. For instance, descriptive statistics are used to understand the basic characteristics of the data, such as mean, median, standard deviation, etc.; correlation analysis is applied to examine the relationships between different management factors, such as the correlation between staffing and medical quality; and regression analysis is employed to predict the effects of multi-campus

management, such as forecasting the growth in medical service volume based on personnel and financial investment. The results are presented and interpreted, with statistical findings displayed in charts, reports, and other forms. The results are then interpreted in the context of the actual situation to provide a decision-making basis for the integrated management of multi-campus public hospitals.

4.1. Comparative Research Method

The first method is literature review: collecting relevant literature on the management of multi-campus public hospitals, both domestically and internationally, to understand the practical implementation of different management models. The second method is field research: conducting on-site visits to the selected 55 tertiary A-level hospitals and engaging in discussions with hospital management and medical staff to gather firsthand data. The third method is data organization and analysis: categorizing and organizing the collected information, using tables, charts, and other visual forms to present the comparative results, and analyzing the reasons behind the observed differences.

4.2. Questionnaire method

Questionnaire Survey Method. The first step is questionnaire design: referencing relevant literature and practical situations to draft the questionnaire, inviting experts for validation and revisions to ensure the scientific validity and reasonableness of the questionnaire. The second step is the pilot survey: selecting a small sample of respondents for a preliminary survey, and optimizing the questionnaire based on the results of the pilot survey. The third step is a formal survey: conducting a large-scale questionnaire survey according to the established survey methods and scope, ensuring a sufficient sample size. The fourth step is data entry and analysis: inputting the survey data into statistical software and conducting descriptive statistical analysis, correlation analysis, etc.

4.3. Statistical Method

The first step is data collection plan formulation: clarifying the sources, methods, and time frame for data collection to ensure the accuracy and completeness of the data. The second step is data collection and verification: collecting data according to the established plan and verifying the data to eliminate errors or outliers. The third step is statistical analysis: using statistical software (such as SPSS, SAS, etc.) to analyze the data, and selecting appropriate statistical models and methods based on the research questions. The fourth step is result reporting: writing a statistical analysis report that thoroughly explains the analysis process and results and provides targeted recommendations and measures.

5. Optimization Pathways for Integrated Management of Multi-Campus Hospitals

From the perspective of systems theory, multi-campus integrated management is

essentially a complex system. In response to the current challenges faced by multi-campus integrated management, it is necessary to overcome fragmentation, one-size-fits-all approaches, and simplifications in management practice. This requires adhering to the developmental laws of public hospital multi-campus systems, emphasizing the characteristics of resource sharing, business collaboration, and technological empowerment in multi-campus integrated management. The goal is to strengthen the system awareness of multi-campus management and standardize the operational processes. Reforms and practices should be carried out from institutional, structural, and technical dimensions [6].

5.1. Institutional Dimension: Top-Level Design to Promote Standardized Management

Although multi-campus integrated management may appear, on the surface, to be a mere integration of various elements operating under a unified management framework, it fundamentally relies on the establishment and improvement of a series of institutional mechanisms.

Firstly, optimizing multi-campus management goals involves adhering to a people-centered approach to healthcare, with a focus on patient needs and high-quality development. This includes scientifically defining the functional positioning of different campuses, clarifying the overarching goals for the development of different campuses, determining the content and pathways for their integrated development, and formulating multiple phased strategies and sub-strategies that adapt to changes in the situation and demands. This approach aims to create a complementary advantage between campuses.

Through integrated management and a differentiated approach, academic development should be planned. This includes clearly defining the primary focus of disciplines at each campus, accelerating the shift from clinically focused disciplines to research-oriented disciplines, and systematically strengthening the academic layout across campuses. Such efforts will facilitate the development of a high-caliber and efficient healthcare service system that not only supports the proliferation of superior medical resources but also promotes effective collaboration and positive engagement among campuses.

Secondly, establishing and improving standardized management systems involves the creation of an integrated human resource management mechanism, including unified recruitment, appropriate rotation, and coordinated allocation of staff. This process will form a mechanism of care and concern, a talent incentive system, and a talent echelon mechanism. At the same time, strict oversight will be implemented through unified recruitment, training, and the assignment of fixed or rotating positions. A unified cultural management system should be established, focusing on institutional culture, behavioral culture, and spiritual culture. Integrated management in these areas should be enforced to strengthen the continuity and innovation of hospital culture. The existing historical and cultural foundations of hospitals should be continuously innovated upon, thus reinforcing the

driving force behind hospital development and innovation. For example, campus designs should be unified, promotional platforms standardized, and the visibility of each campus improved. Additionally, by establishing integrated and standardized operational guidelines for logistical support services, various logistical systems should be effectively implemented. This includes coordinating resource integration, achieving joint bidding for large medical equipment across campuses, and ensuring unified purchasing, which ensures full utilization of equipment and guarantees the integrated operation and management of all campuses.

Thirdly, establishing and improving a goal-based performance evaluation mechanism involves scientifically setting up a performance appraisal system centered around goal management. The system should lock in objectives through dimensions, reflect guiding priorities through weighted scores, and strengthen the effective connection between quantitative and qualitative evaluation indicators. The indicator system should emphasize its overall coherence, differentiation, and specificity. Based on the development of various departments and the specialties of each, the goal-based performance management system should be refined, with continuous improvement in performance levels [7].

5.2. Structural Dimension: Organizational Coordination to Drive Management Effectiveness

From the perspective of systems theory, multi-campus integrated management emphasizes the coordination and synchronization between the elements or subsystems that constitute the system. It requires breaking down barriers caused by departmental silos, fragmented divisions, and internal departmental cycles. The goal is to address the deep-rooted contradictions and issues that restrict collaborative development and achieve effective coordination across campuses and departments, promoting integrated growth.

Initially, optimizing the organizational structure of each campus involves refining departmental frameworks, decentralizing management focus, and improving coordination among multi-campus institutions, functional departments across campuses, and internal collaboration inside each campus. By integrating various dispersed and irregular pieces of business information, the execution capability will be strengthened, and the efficiency of all operations will be improved.

Secondly, strengthening organizational management structure awareness necessitates the augmentation of training for management personnel. It is essential to clarify the relationships between the organizational structures of multi-campus integrated management, as well as the procedures and methods for business coordination. This will form a system for process coordination, data sharing, and personnel collaboration, thereby achieving integrated management and improving the overall management level of multi-campus institutions.

Thirdly, rationally applying modern management methods for integrated collaborative management entails promoting organizational coordination across cam-

puses, sharing medical resources, and synchronizing quality control. It also involves integrating online and offline processes, enhancing the refinement of hospital management [8].

5.3. Technological Dimension: System Iteration to Drive Intelligent Management

Under the trend of high-quality development in public hospitals, the empowerment of digital technologies has significantly enhanced the management efficiency of multi-campus hospital systems. This facilitates real-time synchronization of information and data across different campuses, promotes resource sharing and complementarity of strengths, reduces operational costs, and improves service quality.

First, the continual iteration and enhancement of hospital information systems must be executed, specifically to resolve prevailing challenges such as "information silos" and "information stovepipes." Identifying systematic risks and addressing potential hazards are crucial for propelling digital reform and enhancing security management in multi-campus operations. Utilizing the assurance offered by digital instruments aids in alleviating the unpredictability linked to operational risks.

Second, it is critical to develop interdisciplinary personnel proficient in both information and communication technologies as well as hospital management and medical sciences. Exceptional experts within the current medical workforce should be recognized and taught to develop a cohesive, skilled, and information-literate team to facilitate digital transformation.

Third, it is essential to strengthen information interconnectivity and data sharing, with a strong emphasis on the security of hospital information systems. Guided by standardized frameworks for interoperability and empowered by emerging technologies such as mobile internet, cloud computing, and artificial intelligence, hospitals can implement a unified information system and a centralized data center. This enables the multidimensional integration of medical resources, research, and education across multiple campuses. During the process of hospital digital infrastructure development, equal attention must be paid to cybersecurity. Regular system inspections should be conducted to detect and address potential vulnerabilities in a timely manner. Internally, such systems allow for real-time monitoring and centralized management of operational status across campuses, facilitating unified allocation and accounting of financial resources, coordinated personnel deployment, and standardized logistical support. This contributes to consistent, high-quality management across all campuses and improves the experience of both patients and healthcare providers. Externally, the system offers vital information support for regional healthcare coordination, tiered diagnosis and treatment, and the development of medical alliances [9].

Conflicts of Interest

The authors declare no conflicts of interest.

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