Construction of an Evaluation Indicator System and Cultivation Strategies for Interdisciplinary Healthcare Management Talents – A Case Study Based on the Second Affiliated Hospital of Tianjin University of Traditional Chinese Medicine

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Abstract. Objective: To establish an evaluation indicator system for interdisciplinary management talents that aligns with the distinctive features of traditional Chinese medicine (TCM) hospitals, thereby providing a scientific foundation for the selection, training, and performance appraisal of hospital management personnel. **Methods:** Indicators were identified through literature review, semi-structured interviews, and the Delphi method, and the indicator system was subsequently constructed. The average rank method was used to determine the weights of the first-level indicators. The Second Affiliated Hospital of Tianjin University of Traditional Chinese Medicine served as the empirical site for needs assessment and validation. **Results:** An evaluation system comprising four first-level indicators—management ability, medical literacy, humanistic concern, and innovative thinking—along with several second-level indicators was developed, and corresponding evaluation scales were designed. **Conclusion:** The system demonstrates sound scientific rigor and practical feasibility, offering decision-support tools for talent development in TCM hospitals and similar healthcare institutions.

Keywords: TCM hospitals, interdisciplinary management talents, evaluation system, Delphi method, average rank, competency model.

1 Introduction

With the ongoing deepening of healthcare system reforms, public hospitals are facing unprecedented operational pressures and developmental challenges. On September 19, 2018, the Political Bureau of the CPC Central Committee convened a meeting and approved a document on strengthening Party building, emphasising the cultivation of a high-calibre, professional cadre workforce as a central task. Ultimately, competition among hospitals is competition in management quality and talent calibre. Interdisci-

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plinary management talents—individuals who excel across multiple competency domains—constitute a vital force for high-quality development within hospitals.

Previous studies indicate that most hospital managers in China come from clinical backgrounds; they possess rich clinical experience and familiarity with hospital operations but lack systematic management knowledge. Bridging professional expertise with managerial proficiency and nurturing young technical professionals into managerial leaders has become a critical lever for promoting high-quality hospital development. Meanwhile, as a distinctive component of China's healthcare system, TCM hospitals require their managers not only to possess general management competencies but also to demonstrate TCM cultural literacy and integrated Chinese-Western medicine management capabilities, which imposes higher demands on their "interdisciplinary" profile. However, existing research largely treats hospitals as homogeneous organisations, with insufficient exploration of the specific needs of managers in particular types of hospitals. Systematic studies on the evaluation and cultivation of interdisciplinary management talents specifically in TCM hospitals remain scarce.[1]

This study aims to construct a scientific, systematic, and operable evaluation indicator system for interdisciplinary management talents in TCM hospitals, and on this basis to propose targeted cultivation strategies, using the Second Affiliated Hospital of Tianjin University of Traditional Chinese Medicine as a case for empirical application, thereby providing theoretical grounds and practical guidance for talent development in TCM hospitals.

2 Materials and Methods

2.1 Study Design

A case-based mixed-methods design was adopted. Literature analysis and semi-structured interviews were used to define the connotation of interdisciplinary management talents in TCM hospitals and to construct an initial indicator framework. The Delphi method was applied for indicator screening, and the average rank method was used to assign weights to first-level indicators. An evaluation instrument was developed and empirically tested. Based on the assessment results, cultivation strategies were designed, forming a "evaluation-feedback-cultivation-re-evaluation" closed-loop.

2.2 Literature Analysis

Systematic searches were conducted in CNKI, PubMed, and Web of Science using keywords related to hospital management, competency, and talent evaluation. Policy documents including the Opinions on Promoting High-Quality Development of Public Hospitals and the "14th Five-Year Plan" for Health Human Resource Development were reviewed, alongside domestic and international studies on hospital manager competency models. Through cluster analysis of the literature, a preliminary framework comprising four dimensions—management ability, medical literacy, humanistic concern, and innovative thinking—along with several sub-indicators was distilled.

2.3 Semi-Structured Interviews

Using purposive sampling, 16 individuals were recruited for semi-structured interviews, including senior scholars in hospital management, top-level administrators from tertiary TCM hospitals, and health policy researchers. The 16 experts had a mean age of 45 years and mean working experience of 24.5 years.Interviews explored core connotations, competency requirements, and evaluation challenges of interdisciplinary management talents in TCM hospitals. Characteristic elements mentioned by at least three experts were summarised to derive additional evaluation indicators, supplementing the framework.

2.4 Delphi Method

2.4.1 Expert Panel.

A panel of 30 experts and senior managers from TCM hospital management-related positions was invited. The panel was independent and non-overlapping with the interview participants.

2.4.2 Expert Consultation Questionnaire.

Based on the literature and interview findings, a Consultation Questionnaire for Evaluation Indicators of Interdisciplinary Management Talents in TCM Hospitals was developed. It comprised two parts: (1) expert demographic information (gender, age, education, title, years of experience, etc.); and (2) importance ratings and rankings of indicators. A 5-point Likert scale (1 = very unimportant, 5 = very important) was used to rate each indicator's importance, and experts were asked to rank the four dimensions in order of priority. Open-ended comments were also collected.

2.5 Weighting of First-Level Indicators

After the Delphi process, the average rank method was employed to compute weights for the four first-level indicators. Based on experts' rankings of the four dimensions (from 1st to 4th), scores of 4, 3, 2, and 1 were assigned respectively. Total scores for each dimension were summed and normalised to obtain the final weights.

2.6 Empirical Evaluation

At the Second Affiliated Hospital of Tianjin University of TCM, 22 managers from administrative, logistics, and clinical departments were assessed using the self-developed Evaluation Scale for Hospital Interdisciplinary Management Talents through a 360-degree approach (self-and peer/subordinate/supervisor ratings). Data were analysed using SPSS 26.0 for descriptive statistics, difference tests, and correlation analyses to comprehensively diagnose the current composite competency profile.

2.7 Statistical Analysis

Data were analysed using SPSS 26.0, with statistical significance set at $p < 0.05$.

3 Results

3.1 Definition of Interdisciplinary Management Talents in TCM Hospitals

Through literature analysis and semi-structured interviews, we define such talents as high-level professionals who possess an integrated competency set encompassing "management ability, medical literacy, humanistic concern, and innovative thinking", and who can effectively perform managerial tasks within the specific organisational context of TCM hospitals. Their key characteristics include: systematic management knowledge and skills; basic TCM theoretical knowledge and clinical workflow familiarity; deep TCM cultural identification and patient-centred service philosophy; and strategic vision, change-oriented mindset, and capability to lead disciplinary development and institutional transformation.

3.2 Indicator Screening Results

3.2.1 Expert Demographics.

A total of 30 questionnaires were distributed and all were returned valid (response rate 100%). The 30 Delphi panel members had diverse backgrounds across administration, clinical care, nursing, and logistics, with an average working experience of 14.5 years.

3.2.2 Expert Positivity, Authority, and Consensus.

The response rate was 100%, with an authority coefficient (Cr) of 0.86. All second-level indicators had mean importance scores above 4.00 and coefficients of variation below 0.25, indicating strong expert consensus.

3.2.3 Indicator Retention and Revision.

Based on the 30 valid responses, all first- and second-level indicators had mean importance scores >4.00 and CVs <0.25, thus all were retained. Open-ended suggestions regarding implementation (e.g., rotation systems and differentiated weights) were incorporated into the subsequent cultivation strategy design rather than into the core indicator system.

3.3 Final Indicator System and Weight Allocation

Using the average rank method, the resulting weights from highest to lowest were: management ability (0.390), medical literacy (0.218), humanistic concern (0.211), and innovative thinking (0.182). The full indicator system is shown in Table 1.

Table 1. Evaluation Indicator System and Weights for Interdisciplinary Management Talents in TCM Hospitals.

First-level Indicator	Weight	Second-level Indicators
Management Ability	0.390	Scientific decision-making; Interpersonal communication and coordination; Team building;Execution; Overall planning and coordination; Risk prevention and control; Official document writing
Medical Literacy	0.218	Understanding and application of TCM policies; Familiarity with clinical workflows; Integrated Chinese-Western medicine management; Medical quality and safety management knowledge; Basic TCM knowledge
Humanistic Concern	0.211	TCM cultural identity and inheritance; Patient-centred service philosophy; Professional ethics and integrity; Medical humanistic care practice; Social responsibility and accountability
Innovative Thinking	0.182	Strategic planning; Change management; Discipline construction and research leadership; Information technology application; Cross-disciplinary learning and translation

3.4 Scale Development and Psychometric Testing

Based on the indicator system, the Evaluation Scale for Hospital Interdisciplinary Management Talents was developed, with separate versions for self-assessment and other-assessment (supervisor, peer, subordinate). Each second-level indicator used a 5-point Likert scale with behavioural anchor descriptors.

At the Second Affiliated Hospital, 22 scales were distributed and all were valid (22 respondents, including 14 self-ratings, 4 peer ratings, and 4 subordinate ratings). Reliability analysis showed a total Cronbach's α of 0.939, with sub-dimension α values ranging from 0.832 to 0.901, indicating excellent internal consistency. The KMO value was 0.782, and Bartlett's test of sphericity was significant ($p < 0.001$), suggesting common factors among items; however, due to the limited sample size ($n = 22$), confirmatory factor analysis was not performed, and construct validity requires further examination with larger samples.[2]

3.5 Empirical Evaluation Results

In the formal evaluation, 22 questionnaires were distributed and all returned valid (100% response rate). The assessed managers came from administrative, logistics, and clinical departments. The overall composite competency mean score was 4.31 ± 0.74 (out of 5). Dimension scores in descending order were: humanistic concern (4.55 ± 0.70), management ability (4.35 ± 0.78), innovative thinking (4.29 ± 0.82), and medical

literacy (4.08 ± 0.86). The three lowest-scoring items (raw scores) were TCM knowledge reserve (3.96), strategic foresight (4.09), and team leadership (4.18), identified as common weaknesses.

Differences among rater groups were not statistically significant (one-way ANOVA, $F(2,19) = 1.65$, $p = 0.218$). However, subordinate ratings (4.10 ± 0.85) were slightly lower than self-ratings (4.24 ± 0.64) and peer ratings (4.77 ± 0.42), indicating a potential trend worth noting.

3.6 Cultivation Strategy Design

Based on the empirical findings, a tiered and categorised cultivation strategy system was designed:

(1) Tiered training: Different programmes for senior (focus on innovation), middle (strategic execution and team management), and junior (theoretical learning and practical exercise) managers.

(2) Modular curriculum: Four modules—management ability enhancement, medical literacy deepening, humanistic concern cultivation, and innovative thinking activation—using case-based, scenario-simulation, and action-learning methods.[3]

(3) Mentorship and rotation: Implement management mentorship for high-potential young- and mid-career staff, and establish cross-departmental and cross-level rotation systems to broaden managerial perspectives.

(4) Closed-loop re-evaluation: Establish individual competency development portfolios; link evaluation results to performance appraisal and promotion; conduct annual re-assessments to track progress and enable continuous improvement.[4]

4 Discussion

4.1 Scientific Rigour and Reliability of the Evaluation System

This study integrated literature review, semi-structured interviews, and the Delphi method to systematically screen and determine indicators, with weights assigned via the average rank method. High expert positivity (100%) and strong consensus (all CVs < 0.25) support the reliability of the results. The scale demonstrated good reliability (Cronbach's $\alpha = 0.939$, KMO = 0.782), though construct validity requires further verification with larger samples. These quantitative indicators affirm that the system is scientifically sound, objective, and practical, consistent with previous findings.

4.2 Innovation of the "Four-in-One" Evaluation Framework

We propose a framework incorporating "management ability, medical literacy, humanistic concern, and innovative thinking", moving beyond traditional single-dimension approaches. The inclusion of "medical literacy" highlights the "integration of medicine and management" in TCM hospitals, emphasising that managers must possess basic TCM knowledge and clinical process understanding to achieve

precise management. The “humanistic concern” dimension underscores the special role of TCM cultural inheritance and medical humanistic care in management, aligning with the “people-oriented” philosophy of TCM hospitals.[5]

Management ability carried the highest weight (0.390), confirming its central role. The second-ranked weight of medical literacy (0.218) reflects experts' emphasis on "dual proficiency" in both medicine and management for TCM hospital managers.

4.3 Implications of Empirical Findings

At the Second Affiliated Hospital, the highest score was for humanistic concern (4.55), while medical literacy was the lowest (4.08), particularly the item “TCM knowledge reserve” (3.96). Also low were “strategic foresight” (4.09) and “team leadership” (4.18). This suggests that current TCM hospital managers lack sufficient foundational TCM knowledge and strategic planning capabilities, and that team building has been somewhat neglected. Although rater differences were not statistically significant, subordinate ratings tended to be lower than self- and peer ratings, underscoring the value of incorporating subordinate feedback for a more objective 360-degree assessment.

4.4 Practical Value of the Cultivation Strategies

Our cultivation strategies tightly couple evaluation with training, forming a closed loop of “assessment-diagnosis-cultivation-re-assessment”. The tiered and categorised approach enables targeted, resource-efficient training; the modular curriculum addresses specific competency gaps; and mentorship and rotation provide experiential learning and cross-pollination. This system can directly support the talent-strengthening strategy of the Second Affiliated Hospital and serve as a reference for other TCM hospitals.[5-7]

4.5 Limitations and Future Directions

This study is limited by its single-region sample and the lack of long-term validation of the cultivation strategies. Future research should expand the sample geographically and conduct intervention studies to assess the strategies' effectiveness.[8]

5 Conclusion

Grounded in the realistic needs of high-quality public hospital development and distinctive TCM hospital management, this study used literature analysis, semi-structured interviews, the Delphi method, and the average rank method to construct an evaluation indicator system for interdisciplinary management talents in TCM hospitals. The system comprises four first-level indicators (management ability, medical literacy, humanistic concern, innovative thinking) and 24 second-level indicators, with a supporting evaluation scale. Empirical testing showed good reliability (Cronbach’s α =

0.939, KMO = 0.782) and reasonable weight allocation (management ability 0.390, medical literacy 0.218, humanistic concern 0.211, innovative thinking 0.182), confirming its scientific soundness and operability.

The empirical evaluation revealed that managers' overall competency was moderately high (4.31 ± 0.74), but weaknesses in TCM knowledge, strategic foresight, and team leadership should be prioritised in training. Based on these results, a tiered and categorised cultivation strategy system with a closed-loop management model was formulated.

The indicator system and scale developed herein provide decision-support tools for the selection, training, and appraisal of management talents in TCM hospitals, and the cultivation strategies can directly facilitate the implementation of the talent-strengthening strategy at the Second Affiliated Hospital of Tianjin University of TCM. Future work will expand sample sizes, conduct intervention studies to validate strategy effectiveness, and develop digital assessment tools to enhance scalability and reproducibility.

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