

HUMAN RESOURCE TRANSFORMATION IN A CHINESE UNIVERSITY HOSPITAL AMID HIGH QUALITY DEVELOPMENT: AN EMPIRICAL ANALYSIS BASED ON WORKFORCE STRUCTURE DATA

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Abstract: Human resource (HR) structural optimization constitutes a core engine for high-quality development in Chinese public hospitals. However, existing research predominantly relies on cross-sectional data or single-dimensional analyses, lacking longitudinal tracking of the dynamic adaptation mechanisms between HR structure and service capacity enhancement. This study systematically deconstructs the evolutionary characteristics of HR across six dimensions—total volume, employment type, age, education, position, and professional title—in a regional tertiary Grade-A Chinese public hospital from 2020 to 2025, and constructs a "Structure–Efficiency–Service" adaptability assessment model. A longitudinal panel database was established using six consecutive years of HR and operational data from a Chinese public hospital. Statistical analysis and trend assessment methods were employed to calculate year-on-year growth rates, proportional distributions, and mean values across all structural dimensions. (1) Total HR volume exhibited a "funnel-shaped" moderate growth trajectory, increasing from 2,851 to 2,915 over six years (cumulative growth rate: 2.24%; annual average: 0.37%), with contract-based employment assuming the dominant position. (2) The workforce demonstrated significant aggregation toward middle-aged backbone personnel (31–40 years), higher educational attainment (master's degree holders increased by 32.8%), and intermediate-to-senior professional titles (intermediate titles rising from 29.3% to 54.2%). (3) Structural contradictions persist in Chinese public hospitals, manifested as divergent growth rates between medical-technical/administrative positions and clinical demand, shrinkage of the junior-title talent pipeline, and asynchrony between frontline clinical staffing and service volume growth. This study proposes transformation pathways including dynamic workforce volume regulation, scientific position management systems, full-chain talent cultivation mechanisms, efficiency-oriented incentive systems, and core talent retention strategies, providing empirical evidence and practical paradigms for constructing HR governance systems adapted to high-quality development requirements in Chinese public hospitals.

Keywords: Public hospitals; High-quality development; Human resource transformation; Workforce structure; Service efficiency; University-affiliated hospital

1 INTRODUCTION

Public hospitals constitute the cornerstone of China's medical service system, and their high-quality development bears directly on population health improvement and the macro-efficiency of medical resource allocation. The General Office of the State Council issued the Opinions on Promoting High-Quality Development of Public Hospitals, explicitly clarifying that hospital development urgently needs to shift from "scale expansion" to "connotation improvement" [1]. In this transformative process, human resources, as the core production factor of medical services, whose structural optimization and efficiency release form the endogenous driving force supporting this strategic transformation. The quality, structure, and allocation efficiency of human capital directly determine the ceiling of medical service capacity and the sustainability of discipline construction.

University-affiliated public hospitals undertake the dual missions of medical service and medical education, and their human resource management faces more complex requirements of clinical practice, teaching, and research coordination [2]. Compared with general public hospitals, university-affiliated institutions must simultaneously satisfy the demands of patient care, undergraduate and postgraduate education, scientific research output, and technology translation. Currently, with the in-depth advancement of medical insurance payment reform, reshaping of regional competition patterns, and diversified upgrading of public health demands, the traditional extensive human resource management mode can no longer adapt to new-era requirements for medical quality, discipline construction, and operational efficiency [3]. The diagnosis-related group (DRG) payment reform, in particular, imposes stringent requirements on cost control and service efficiency, compelling hospitals to reconsider their manpower deployment strategies.

Existing literature indicates that imbalanced human resource structure in tertiary hospitals directly restricts the improvement of medical service quality [4]; while synergy between manpower efficiency and core service indicators is a key dimension to measure high-quality development effectiveness [5]. International studies have demonstrated that

health workforce planning significantly influences hospital performance, with optimal staffing ratios contributing to improved patient outcomes and reduced operational costs [6]. However, most existing studies are limited to single-dimensional cross-sectional analysis and lack long-term longitudinal tracking, making it difficult to reveal the dynamic adaptation mechanism between workforce structure evolution and service capacity improvement [7]. In addition, existing countermeasures are mostly macro-oriented and lack precise implementation paths based on empirical data of university-affiliated hospitals. The gap between policy guidance and operational practice remains substantial, particularly in the context of Chinese public hospitals where institutional constraints and market pressures coexist.

Against this backdrop, this study selects six-year consecutive longitudinal data of a university-affiliated tertiary class-A hospital in China from 2020 to 2025, systematically sorts out six structural characteristics of human resources, builds a three-dimensional analytical framework of "structure driving-efficiency transformation-service improvement," and deeply analyzes the adaptability between human resource management and high-quality development. This study aims to reveal the law of human resource transformation in university-affiliated public hospitals through long-cycle data, and expand the dimension of refined manpower management from the supply-demand matching perspective, so as to provide a scientific basis for public hospitals to break through efficiency bottlenecks and build a manpower governance system adapted to high-quality development. The contributions of this study are threefold: first, it provides rare longitudinal evidence spanning six years, capturing the complete cycle of post-pandemic recovery and reform adaptation; second, it integrates workforce structure analysis with business performance indicators, establishing a closed-loop evaluation framework; third, it proposes actionable transformation paths grounded in empirical findings rather than purely theoretical prescriptions.

2 RESEARCH METHODS

2.1 Research Objects

This study selected a representative regional Chinese tertiary Grade-A public hospital as the empirical sample and constructed a longitudinal panel database of HR and medical service operations spanning 2020–2025. Data were systematically collected across six dimensions: total personnel volume, employment type, demographic characteristics, age, position, and professional title, delineating the dynamic evolutionary trajectories of human capital stock characteristics and core medical service capacity indicators in this Chinese public hospital, forming a closed-loop data chain of "input–process–output."

2.2 Research Methods

This study primarily employed statistical analysis methods to calculate quantitative indicators including year-on-year growth rates, proportional distributions, and mean values for hospital HR and various service data from 2020 to 2025. The analysis examined structural characteristics across HR dimensions and their relationships with operational indicators such as outpatient visits, inpatient admissions, and surgical procedures. Trend assessment of HR efficiency changes was conducted to identify supply-demand issues in HR allocation within the Chinese public hospital context and propose priority directions for future HR management.

3 RESULTS

3.1 Total HR Volume Characteristics

3.1.1 Low-speed growth in total personnel

From 2020 to 2025, the Chinese public hospital's total personnel exhibited an overall "funnel-shaped" trend of initial slight decline followed by recovery: decreasing from 2,851 in 2020 to 2,833 in 2022, then gradually recovering to 2,915 in 2025. The six-year cumulative increase was 64 persons, representing a growth rate of 2.24% and an annual average growth rate of approximately 0.37%, indicating sustained low-speed growth in total personnel volume.

3.1.2 Deceleration of per capita efficiency growth

Table 1 Per Capita Efficiency Statistics, 2020-2025

year	Total number of personnel	Year-over-year growth rate	Per capita productivity	Year-over-year growth rate
2020	2851	6.3%	54.09	5.4%
2021	2864	0.5%	55.10	1.87%
2022	2833	-1.1%	56.39	2.33%
2023	2873	1.4%	59.28	5.13%
2024	2888	0.5%	57.53	-2.95%
2025	2915	0.9%	56.64	-1.56%

From 2020 to 2024, personnel growth and per capita efficiency growth exhibited significant phased characteristics. During 2021–2023, total personnel year-on-year growth rates were 0.5%, −1.1%, and 1.4%, while per capita efficiency growth rates were 1.87%, 2.33%, and 5.13%, respectively—per capita efficiency growth substantially exceeding personnel growth, generating scale-increasing effects. After 2024, personnel grew by 0.5% and 0.9% year-on-year,

while per capita efficiency declined by 2.95% and 1.56%, respectively, reflecting that HR efficiency enhancement in this Chinese public hospital has encountered a bottleneck, and the scale-expansion development model can no longer adapt to current Chinese healthcare reform contexts and high-quality development requirements. Specific data are presented in Table 1.

3.2 HR Structural Characteristics

From 2020 to 2025, the combined number of establishment-based (*bianzhi*) and contract-based personnel in this Chinese public hospital grew from 2,613 to 2,801, an increase of 188 persons (growth rate: 7.2%). The four structural dimensions—age, education, position, and professional title—exhibited distinct evolutionary characteristics, progressing overall toward higher quality and greater rationalization.

3.2.1 Age structure: shift toward middle-aged backbone personnel

The age structure exhibited characteristics of "declining under-30 cohort, relatively stable 31–40 cohort, and steadily increasing over-40 cohort," with significantly enhanced workforce maturity. From 2020 to 2025, personnel under 30 decreased from 489 to 283 (proportion declining from 18.7% to 10.1%), closely associated with narrowed new recruitment in the Chinese public hospital. The 31–40 age group proportion rose then declined, stabilizing at 53%, becoming the core workforce cohort. Personnel aged 41–50 increased steadily, reaching 25.7% by 2025. Over six years, the average employee age increased from 37 to 39 years, with middle-aged backbone personnel becoming the mainstay of disciplinary construction and medical services. Specific data are presented in Table 2.

Table 2 Employee Age Structure Statistics, 2020–2025

Year	Total Count	≤ 30 years (%)	31–40 years (%)	41–50 years (%)	≥ 50 years (%)	Average years
2020	2613	489 (18.7%)	1400 (53.6%)	518 (19.8%)	206 (7.9%)	37
2021	2660	394 (14.8%)	1454 (54.7%)	565 (21.2%)	247 (9.3%)	37
2022	2675	330 (12.3%)	1513 (56.5%)	577 (21.6%)	255 (9.5%)	38
2023	2758	320 (11.6%)	1526 (55.3%)	641 (23.2%)	271 (9.8%)	38
2024	2775	298 (10.7%)	1517 (54.7%)	693 (25.0%)	267 (9.6%)	38
2025	2801	283 (10.1%)	1500 (53.5%)	720 (25.7%)	298 (10.6%)	39

3.2.2 Educational attainment: significant improvement in higher-degree proportions

The Chinese public hospital actively promoted educational upgrading through recruiting high-degree talent and encouraging in-service personnel to pursue advanced studies. Over six years, doctoral degree holders increased from 37 to 54 (excluding those currently enrolled), with proportion rising from 1.4% to 1.9%; master's degree holders grew from 607 to 806, with proportion increasing from 23.2% to 28.8%; bachelor's degree holders fluctuated from 1,727 to 1,822, maintaining a stable proportion of approximately 65.0% as the absolute mainstay; personnel with associate degree or below decreased substantially from 242 to 119, with proportion declining from 9.3% to 4.2%. In summary, the proportion of master's-and-above talent grew steadily, bachelor's-level talent remained basically stable, and sub-bachelor's talent declined significantly, indicating substantial improvement in overall educational attainment within this Chinese public hospital. Specific data are presented in Table 3.

Table 3 Employee Educational Structure Statistics, 2020–2025

Year	Total	Doctorate (%)	Master (%)	Bachelor (%)	Associate & Below (%)
2020	2,613	37 (1.4%)	607 (23.2%)	1,727 (66.1%)	242 (9.3%)
2021	2,660	37 (1.4%)	652 (24.5%)	1,741 (65.5%)	230 (8.6%)
2022	2,675	38 (1.4%)	664 (24.8%)	1,781 (66.6%)	192 (7.2%)
2023	2,758	42 (1.5%)	710 (25.7%)	1,851 (67.1%)	155 (5.6%)
2024	2,775	45 (1.6%)	769 (27.7%)	1,829 (65.9%)	132 (4.8%)
2025	2,801	54 (1.9%)	806 (28.8%)	1,822 (65.0%)	119 (4.2%)

3.2.3 Position distribution: relative stability with significant divergent growth

Table 4 Employee Position Structure Statistics, 2020–2025

Year	Total	Clinical (%)	Pharmacy (%)	Nursing (%)	Medical Tech (%)	Admin (%)	Research (%)
2020	2,613	768 (29.4%)	75 (2.9%)	1,279 (48.9%)	138 (5.3%)	340 (13.0%)	13 (0.5%)
2021	2,660	812 (30.5%)	78 (2.9%)	1,282 (48.2%)	143 (5.4%)	332 (12.5%)	13 (0.5%)
2022	2,675	799 (29.9%)	74 (2.8%)	1,290 (48.2%)	150 (5.6%)	349 (13.0%)	13 (0.5%)
2023	2,758	812 (29.4%)	79 (2.9%)	1,316 (47.7%)	163 (5.9%)	375 (13.6%)	13 (0.5%)
2024	2,775	837 (30.2%)	79 (2.8%)	1,311 (47.2%)	176 (6.3%)	360 (13.0%)	12 (0.4%)
2025	2,801	835 (29.8%)	77 (2.7%)	1,329 (47.4%)	177 (6.3%)	370 (13.2%)	13 (0.5%)

From 2020 to 2025, physician numbers in this Chinese public hospital grew from 768 to 835, maintaining approximately 30% of total personnel (growth: 8.7%). Nursing staff increased from 1,279 to 1,329 (growth: 3.9%). Pharmacy personnel fluctuated from 75 to 77, with proportion declining from 2.9% to 2.7%, reflecting pharmacy service model transformation in Chinese hospitals. Medical-technical personnel grew from 138 to 177 (proportion rising

to 6.3%; growth: 28.3%). Administrative and logistics personnel increased from 340 to 370, maintaining a proportion of 13.0%–13.6% (growth: 8.8%). Compared to 2020, medical-technical, administrative-logistics, and physician positions all exceeded the total personnel growth rate, with medical-technical personnel exhibiting the most significant growth. Specific data are presented in Table 4.

3.2.4 Professional title structure: rising intermediate-to-senior proportions

From 2020 to 2025, the professional title structure in this Chinese public hospital exhibited an optimization trend of "stable senior, rising intermediate, and declining junior," highly consistent with the age structure shift toward middle-aged personnel. Senior title personnel maintained a stable proportion of approximately 24%, with full senior (zhenggao) at 6.0%–7.0% and associate senior (fugao) at 16.3%–18.4%. Intermediate titles grew substantially from 766 to 1,517, with proportion rising from 29.3% to 54.2%, becoming the absolute mainstay—consistent with the career development of the 31–40 core age cohort. Junior titles decreased continuously from 1,313 to 646, with proportion declining from 50.2% to 23.1%, attributable to narrowed recruitment, promotion to intermediate levels, and non-replacement of departing junior-title personnel. Specific data are presented in Table 5.

Table 5 Employee Professional Title Structure Statistics, 2020–2025

Year	Total	Senior (%)	Associate Senior (%)	Intermediate (%)	Junior (%)
2020	2,613	131 (5.0%)	403 (15.4%)	766 (29.3%)	1,313 (50.2%)
2021	2,660	189 (7.1%)	489 (18.4%)	1,129 (42.4%)	853 (32.1%)
2022	2,675	176 (6.6%)	462 (17.3%)	1,286 (48.1%)	751 (28.1%)
2023	2,758	193 (7.0%)	474 (17.2%)	1,370 (49.7%)	721 (26.1%)
2024	2,775	194 (7.0%)	474 (17.1%)	1,441 (51.9%)	666 (24.0%)
2025	2,801	181 (6.5%)	457 (16.3%)	1,517 (54.2%)	646 (23.1%)

3.3 Core Operational Indicator Characteristics

From 2020 to 2025, core operational indicators of this Chinese public hospital exhibited characteristics of "slight outpatient decline, steady inpatient growth, substantial surgical and high-difficulty procedure increases, continuous average length-of-stay reduction, and sustained high bed utilization," reflecting a business development transition from "scale expansion" to "quality improvement and efficiency optimization" in line with China's high-quality development requirements. Specific data are presented in Table 6.

Table 6 Core Hospital Operational Indicators, 2020–2025

Year	Outpatient Visits	Discharges	Surgeries	Grade-IV Surgeries	Avg. LOS (days)	Bed Utilization	Non-local Patient Rate	Case Mix Index
2020	1,329,904	77,723	18,193	3,140	10.17	87.10%	19.05%	1.21
2021	1,639,164	89,448	20,934	3,718	9.52	87.70%	17.29%	1.16
2022	1,753,733	88,198	21,426	4,146	9.03	96.30%	28.08%	1.15
2023	1,449,056	100,783	23,578	4,926	8.42	99.90%	22.30%	1.16
2024	1,404,288	99,472	25,234	5,357	8.25	89.70%	23.19%	1.17
2025	1,351,158	102,694	27,508	5,490	7.91	89.20%	25.01%	1.17

Outpatient visits peaked in 2022 then gradually declined, influenced by improved primary healthcare service capacity across China, with outpatient services transitioning toward "precision and specialization." Discharges increased by 24,971 (growth: 32.1%), indicating continuously enhanced inpatient service capacity. Surgeries increased by 9,315 (growth: 51.2%), with Grade-IV surgeries growing from 3,140 to 5,490 (growth: 74.8%), reflecting significant improvement in disciplinary construction and medical technical capability. Average length of stay decreased continuously from 10.17 to 7.91 days, indicating substantially improved service efficiency.

3.4 Talent Outflow Characteristics

From 2020 to 2025, total outflow from this Chinese public hospital was 375 persons, with an average turnover rate of 2.3%. Establishment-based (bianzhi) personnel outflow accounted for 271 persons (72.3%), while contract-based outflow was 104 persons (27.7%). With China's salary system reform implementing equal pay for equal work, contract-based personnel outflow decreased year by year, reflecting progressive improvement in incentive mechanisms and career development guarantees for contract-based staff in Chinese public hospitals, with gradually enhancing stability.

4 DISCUSSION

4.1 Positive Features of Human Resource Development

4.1.1 Comprehensive optimization of the human resource structure

In terms of age distribution, the middle-aged and young workforce aged 30–40 has become the core group, with both team maturity and work efficiency showing simultaneous improvement; in terms of educational background, the

proportion of personnel holding master's degrees or higher qualifications increased by 33.5%, while the proportion of personnel with associate degrees or below decreased by 50.8%, laying a solid foundation for medical technological innovation and disciplinary development; in terms of professional titles, the share of intermediate-level professional titles rose to 54.2%, while the share of senior-level professional titles remained stable at 24%, establishing a virtuous career progression pathway characterized by "promotion from junior to intermediate levels and advancement from intermediate to senior levels," thereby significantly enhancing the professional competence and service quality of the talent pool [7].

4.1.2 Talent development is effectively aligned with business growth

The number of surgical procedures increased by 51.2%, the volume of Level IV surgeries rose by 74.8%, and the capacity for high-difficulty medical services has been significantly enhanced, consistent with the steady expansion of the physician workforce and the growth of medical technical staff; meanwhile, the average length of hospital stay continued to shorten by 2.26 days, the number of discharges increased by 32.1%, and the proportion of patients from outside the region seeking medical care reached 25.01%. These outcomes demonstrate that the structural optimization of human resources has provided a core foundation for business development, thereby helping the hospital achieve dual improvements in both service quality and operational efficiency [8].

4.1.3 The overall stability of the talent pool is relatively strong

From 2020 to 2024, the average turnover rate of hospital personnel was approximately 2.3%, falling within a reasonable range for the healthcare sector; meanwhile, the turnover rate among contract-based staff has continued to decline. The ongoing implementation of independent evaluation processes for senior professional titles has enabled dynamic replenishment of core talent, effectively mitigating the pressure of talent loss resulting from resignations or retirements, thereby ensuring the stability of the core talent team [9].

4.2 Pain Points and Challenges in the Transformation of Human Resource Management in Public Hospitals

4.2.1 Insufficient alignment between the total workforce size and business development needs

In 2024, the personnel growth rate exceeded the revenue growth rate for the first time, while per capita productivity declined slightly. Regarding core business operations, the number of discharged patients increased by 32.1%, and the number of surgical procedures increased by 51.2%; however, the physician workforce grew by only 8.7%, and the nursing staff grew by only 3.9%. This mismatch between the expansion of clinical frontline positions and the corresponding increase in business volume has resulted in an excessive workload for clinical medical staff, which has, to some extent, hindered further improvements in healthcare service quality. Additionally, the slow growth in the total workforce size conflicts with the current high bed occupancy rates, gradually exacerbating the shortage of clinical frontline manpower [10].

4.2.2 The job structure configuration is unbalanced

Human resource allocation is uneven: the workload for core key personnel is relatively high, while the work efficiency of some staff members is relatively low, and the optimization of existing human resources remains insufficient [11]. The number of medical and technical staff increased by 28.3%, while the number of administrative and logistical staff increased by 8.8%; both figures exceeded the overall growth rate of the total workforce. Some medical and technical positions exhibit issues such as redundant staffing and low work efficiency; therefore, the streamlining reform of administrative and logistical functions still requires further deepening, and service efficiency needs to be enhanced.

4.2.3 The system for attracting and cultivating high-level talents remains inadequate

Although the number of PhD holders has increased, their proportion is only 1.9%. Due to constraints such as geographical location, economic development level, and scientific research platforms, the hospital faces challenges in attracting high-level talents characterized by "few candidates, low quality, and instability"; particularly, there is a pronounced shortage of high-level talents in key disciplines and emerging fields. Additionally, internal issues include an incomplete talent cultivation chain and an imperfect performance evaluation mechanism—especially insufficient support for the cultivation of young talents, coupled with lagging development of the reserve talent pool, which makes it difficult to meet the long-term talent demands for the hospital's high-quality development [12].

4.2.4 There exists a risk of talent pipeline disruption

The proportion of personnel holding junior professional titles has declined from 50.2% to 23.1%; while this trend aligns with the broader objective of optimizing the professional title structure, the narrowing recruitment pool for new staff combined with high turnover rates has resulted in insufficient new hires with junior professional titles, leading to a gradual shrinkage of the "base layer" of the talent pipeline and creating a potential risk of talent pipeline disruption. In the future, inadequate replenishment of personnel with intermediate and senior professional titles will hinder the sustainable development of the talent pool and may also lead to staffing shortages on clinical front-line medical service positions [13].

4.2.5 The core talent retention mechanism requires further refinement

The total number of talent departures has been increasing year by year, with departures of key personnel within the official staffing quota accounting for 70.7% of all departures. This trend primarily stems from intensifying regional medical competition, where hospitals in coastal provincial capitals are competing to recruit core key talents through high salaries and generous benefits; meanwhile, the hospital's compensation system—based on job positions and aligning pay with responsibilities—has not yet been fully established, resulting in a limited leverage effect of

compensation incentives and failing to fully reflect the value of core talent, thereby progressively escalating the risk of core talent attrition.

5 COUNTERMEASURES AND RECOMMENDATIONS

5.1 Precisely Control the Total Talent Pool to Achieve Dynamic Alignment

Establish a dynamic regulation mechanism for the total talent pool. Using a average talent outflow rate of 2.3% as the recruitment threshold, implement the principle of "one departure, one recruitment; high-quality recruits enter while less qualified ones leave," strictly controlling the scale of the talent pool to prevent unbalanced growth. In conjunction with the hospital's business development plan, develop human resource demand forecasting models for core operational indicators such as outpatient services, inpatient care, and surgical procedures; precisely calculate the manpower requirements for each position to achieve dynamic alignment between human resource allocation and business development. Recruitment plans should prioritize clinical frontline positions and high-level talents to address staffing shortages in clinical frontline departments; for key disciplines and emerging fields, formulate personalized talent attraction policies, provide full-cycle housing support programs, assist in resolving housing issues, children's school enrollment, and spouse employment services, thereby enhancing the hospital's attractiveness to talent.

5.2 Establish a Scientific Job Management System to Optimize Existing Human Resources

Implement a comprehensive initiative across the entire hospital to define positions, responsibilities, staffing quotas, and personnel allocations; clarify the work duties, performance standards, qualification requirements, and staffing numbers for each position, thereby achieving "clear job responsibilities, reasonable staffing quotas, and optimal alignment between personnel and positions." Establish a dynamic cross-departmental position adjustment mechanism: through position review, redundant staff should be reallocated to positions facing manpower shortages, enabling rational internal resource allocation and enhancing the efficiency of human resource deployment. Develop a talent evaluation system focused on medical ethics, professional competence, and performance outcomes; link assessment results with position adjustments, compensation distribution, and professional title promotions, thereby implementing the principle of "promoting the competent, demoting the mediocre, and eliminating the underperforming".

5.3 Establish a Comprehensive Talent Cultivation System Across the Entire Chain to Strengthen the Reserve Talent Pool

A full-chain cultivation system encompassing "young talents – top-tier talents – discipline leaders – leading talents" shall be established; personalized cultivation plans shall be developed for talents at different levels to achieve precise and systematic talent cultivation. Efforts shall be intensified to cultivate young talents to mitigate the risk of talent echelon gaps. A special talent cultivation fund shall be established to provide talents at all levels with support for external training, research funding, project application assistance, team formation, and access to research platforms, thereby ensuring the smooth implementation of talent cultivation initiatives. Cooperation with renowned hospitals and universities shall be continuously strengthened by dispatching outstanding talents for external training; the talent cultivation assessment mechanism shall be refined by implementing regular assessments and final evaluations for candidates; those who pass the assessment shall continue to receive cultivation support, while those who fail the assessment shall have their cultivation eligibility revoked, thereby establishing a flexible cultivation mechanism that allows for both promotion and demotion, as well as entry and exit.

5.4 Improve the Incentive Mechanism to Unleash Human Potential

Establish a compensation system based on "position-based pay, responsibility-appropriate pay, and performance-linked compensation," linking compensation to job value, work performance, and work efficiency, thereby enhancing the compensation levels of core key personnel and frontline clinical medical staff. Introduce innovative special awards such as the Scientific Research Innovation Award, Medical Quality Award, and Operational Efficiency Award, offering substantial rewards to individuals who make outstanding contributions in areas such as scientific research innovation, improvement of medical quality, and optimization of operational efficiency, thereby stimulating employees' work motivation and innovative spirit.

Optimize the professional title evaluation mechanism.

Increase clinical workload metrics and quality indicators, explore the implementation of a "representative work" system for academic achievements, reduce the emphasis on the quantity of publications, and align professional title evaluation more closely with clinical realities. Establish a human resource efficiency assessment mechanism by incorporating core indicators such as outpatient visits, surgical procedures performed, and average length of hospital stay into the evaluation framework; recognize and reward departments and individuals demonstrating high operational efficiency, thereby encouraging all departments to optimize their staffing configurations and maximize the utilization of human resources.

5.5 Strengthen the Core Talent Retention Mechanism to Mitigate Talent Attrition Risks

Establish a mechanism for identifying and cultivating core talents; conduct a comprehensive review of key core personnel based on the specific operational characteristics of each department, and establish a core talent database. Refine the incentive and safeguard mechanisms for core talents by introducing salary components that reflect job value and labor characteristics—such as position allowances and research allowances—and prioritize the allocation of bonuses toward frontline clinical staff to fully stimulate their work motivation. Foster a distinctive hospital culture that prioritizes employees' physical and mental well-being, establish a mental health counseling system, and enhance the team spirit and cohesion among medical staff.

6 FUTURE OUTLOOK

The high-quality development of public hospitals is a long-term systematic endeavor, in which the transformation of human resource management permeates the entire process. With the advancement of healthcare insurance payment reform and the application of new technologies such as artificial intelligence, human resource management in public hospitals will evolve toward a "refined, digitalized, and intelligent" direction. This study employs panel data on human resource structures for analysis, proposing new perspectives and approaches for the transformation of human resource structures within the context of high-quality development in public hospitals; however, it has not yet discussed a dynamic matching model between human resources and business development or discipline construction, and its analytical perspective remains somewhat limited. In the future, building upon human resource structure analysis, efforts should be made to achieve refined human resource management by precisely controlling total workforce size, optimizing structural composition, and improving relevant mechanisms, thereby ensuring that the total number of talents aligns with business development, the structural configuration with discipline construction, and overall efficiency with the requirements for high-quality development.

7 CONCLUSION

This study, based on six-year longitudinal panel data from 2020 to 2025, systematically examines the human resource transformation trajectory of a university-affiliated tertiary class-A public hospital in China. The findings demonstrate that the hospital has achieved significant structural optimization across multiple dimensions, including employment form rationalization, age structure maturation, education hierarchy upgrading, and title structure advancement. These positive changes have provided solid talent support for the hospital's business development, as evidenced by substantial growth in operation volume, grade IV surgeries, and regional influence.

However, the study also identifies critical challenges that require urgent attention: the mismatch between clinical manpower supply and service demand growth, unbalanced post allocation, insufficient high-level talent pipeline, junior echelon shrinkage, and rising core talent outflow. These structural contradictions, if left unaddressed, may undermine the sustainability of high-quality development achievements.

The proposed five-dimensional transformation framework—encompassing dynamic total regulation, scientific post management, whole-chain talent cultivation, efficiency-oriented incentives, and core talent retention—provides actionable pathways for addressing these challenges. Future research should extend the longitudinal observation period, incorporate multi-hospital comparative analysis, and explore the moderating effects of digital transformation on human resource efficiency in public hospital settings.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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