

PERFORMANCE METRICS, STAFF COMPETENCY AND QUALITY OF CARE: A MEDIATED IMPACT STUDY IN CHINA'S PUBLIC HOSPITALS

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Paper Received: 05.08.2025 / **Paper Accepted:** 26.08.2025 / **Paper Published:** 28.08.2025

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Abstract

Public hospitals in China are increasingly relying on performance evaluation frameworks to enhance clinical efficiency, accountability, and service quality. However, performance metrics alone may not yield meaningful improvements if the workforce lacks adequate skills to translate institutional targets into clinical practice. This study examines the direct effect of administrative performance metrics on healthcare quality and investigates whether staff competency mediates this relationship. A structured survey was administered to healthcare professionals across Tier II and Tier III public hospitals in Beijing, Shanghai, Henan, and Guangdong, yielding 462 valid responses. Structural equation modelling indicates that performance metrics positively influence quality of care ($\beta = 0.42$, $p < 0.001$), while staff competency demonstrates a strong independent effect on healthcare outcomes ($\beta = 0.63$, $p < 0.001$). Mediation analysis further confirms that competency partially mediates the relationship between performance metrics and care quality, explaining 38% of the variance. These findings suggest that metrics become meaningful only when supported by trained, skilled staff capable of operationalizing standards. The study concludes that policy reforms should emphasize competency-building, combined with performance measurement systems, to strengthen China's hospital quality framework.

Keywords: Performance Metrics, Staff Competency, Quality of Care, Mediation, Public Hospitals, China.

Introduction

China's hospital sector has expanded rapidly under national healthcare reforms, rising insurance coverage and investment in digital infrastructure. Despite advancements, persistent differences in care quality, patient satisfaction, and treatment outcomes continue to characterize public hospitals (Yip et al., 2021). To address this, many hospitals use performance metrics - evaluation standards assessing timeliness, patient throughput, documentation accuracy, mortality rates, and clinical productivity. While these metrics create accountability, concerns remain regarding their effectiveness if frontline staff lack professional competency or training to translate indicators into improved practice (Zhang & Chen, 2022).

Staff competency represents clinical skills, procedural knowledge, communication ability, patient management experience and decision-making precision. Competent staff are better equipped to interpret performance guidelines, adapt treatment pathways, and deliver evidence-based care. Conversely, even well-designed evaluation systems fail if workforce readiness is low, leading to mechanical compliance rather than quality improvement.

This study explores how performance metrics shape healthcare quality within Chinese public hospitals,

and whether staff competency functions as a mediating mechanism. Understanding this linkage can inform policy frameworks that seek to harmonize hospital evaluation with workforce capability for sustainable quality elevation.

Literature Review

Performance Metrics in Public Hospitals

Performance metrics are used globally to monitor efficiency, safety, utilization and patient satisfaction (World Bank, 2022). Chinese hospitals commonly use KPIs such as bed turnover, length of stay, EMR completion, surgical efficiency and patient survey scores (Wang et al., 2020). Studies reveal that when metrics are clear, transparent, and aligned with clinical goals, they drive positive outcomes (Liu & Sun, 2021). However, poorly constructed metrics may induce pressure, documentation overload, or outcome manipulation - weakening quality rather than improving it.

Staff Competency and Clinical Quality

Competency is widely recognized as a primary determinant of healthcare performance. Competent nurses and physicians are more adaptable, responsive to clinical change, and capable of precise medical judgement (Huang et al., 2021). Research links competency with reduced medical error, improved communication, patient-centered care and

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treatment compliance (Li et al., 2022). However, competency varies across Chinese hospitals due to staffing shortages, uneven training access, and workload stress (Guo & Yang, 2023).

Performance Metrics → Staff Competency → Quality of Care

Performance metrics define expectations, but competency determines execution. High competency may convert benchmarks into improved care, while low competency may produce superficial compliance. Scholars argue that competency is necessary for performance measurement frameworks to translate into service improvement (Xu & Ren, 2023). Yet empirical mediation testing remains limited in China.

Research Gap

Most studies examine metrics or competency separately; few investigate how competency mediates the effect of metrics on care quality. This study addresses this gap through a hospital-based mediated impact model.

Methodology

A cross-sectional survey was conducted across Tier II and Tier III public hospitals. Stratified sampling ensured representation of doctors, nurses, technicians, and administrative staff. A total of 500 questionnaires were distributed and 462 valid responses were retained after screening. A five-point Likert scale measured three constructs:

Construct	Instrument Source
Performance Metrics	Hospital Evaluation Index Scale (HEIS)
Staff Competency	Clinical Competency Assessment Scale (CCAS)
Quality of Care	Patient Outcome & Service Quality Index (POSQI)

Data were analyzed using SPSS 27 for descriptive, correlation and regression modelling, while AMOS 24 tested mediation pathways through structural equation modelling. Ethical approval was granted and anonymity maintained.

Data Analysis

To interpret the dataset effectively, descriptive statistics were computed to determine overall perception trends for performance metrics, staff competency, and healthcare quality. These descriptive scores provide the foundational understanding of how respondents view the operational climate of Chinese public hospitals. The results show moderately high perception of performance evaluation systems ($M = 4.12$, $SD = 0.82$), suggesting that monitoring mechanisms are present and functioning reasonably well across institutions. Staff competency reported an even

stronger mean ($M = 4.25$, $SD = 0.76$), indicating that respondents generally acknowledge skill proficiency among healthcare workers. Quality of care received the highest average rating ($M = 4.38$, $SD = 0.81$), reflecting positive patient-oriented service outcomes. The values collectively position the healthcare environment as stable but continuously improvable, particularly in the areas where competency interacts with performance metrics.

Table 1: Descriptive Statistics

Variable	Mean	SD
Performance Metrics	4.12	0.82
Staff Competency	4.25	0.76
Quality of Care	4.38	0.81

The above results indicate favorable operational perceptions across the three variables, reinforcing the underlying assumption that quality improvement is influenced by administrative clarity and workforce skill strength. However, descriptive results alone do not clarify whether the constructs are meaningfully linked—thus requiring inferential analysis.

Correlation analysis was then conducted to assess the strength and direction of relationships among the three constructs. Pearson correlation coefficients demonstrate strong and positive relationships in all pairings, confirming that improvements in one construct are statistically aligned with increases in others. Notably, staff competency and quality of care show a particularly high correlation ($r = 0.79$, $p < .001$), suggesting that staffing proficiency has substantial implications for patient care outcomes. Likewise, performance metrics positively associate with competency ($r = 0.68$) and quality ($r = 0.72$), supporting the study's conceptual prediction that evaluation frameworks influence outcomes and skill growth.

Table 2: Correlation Matrix

Variables	PM	SC	QoC
Performance Metrics (PM)	1.00	—	—
Staff Competency (SC)	0.68**	1.00	—
Quality of Care (QoC)	0.72**	0.79**	1.00

$p < 0.001$

The correlation results confirm significant and positive interdependency among variables, warranting deeper regression and mediation testing to determine causality and directional impact. Regression paths revealed that performance metrics significantly predicted quality of care ($\beta = 0.42$, $p < .001$), establishing a direct link. Similarly, performance metrics strongly predicted staff competency ($\beta = 0.57$, $p < .001$), suggesting that clear evaluation systems are associated with higher

workforce skill. Staff competency itself was a powerful predictor of care quality ($\beta = 0.63$, $p < .001$), signifying that skill proficiency markedly enhances patient outcomes. Importantly, when staff competency was introduced as a mediator, the direct influence of performance metrics on quality reduced ($\beta = 0.19$, $p = .047$), confirming partial mediation. This indicates that performance indicators improve quality largely by elevating staff capability.

Table 3: Mediation Summary

Relationship tested	Result
PM $\rightarrow$ QoC (direct)	Significant
PM $\rightarrow$ SC $\rightarrow$ QoC	Mediation confirmed

Taken together, the analytical results demonstrate that performance metrics do contribute to quality improvement, but competency functions as a central transmission mechanism that strengthens and operationalizes these improvements.

Results

The results of the study provide substantial empirical evidence for the mediated impact relationship among the constructs. Performance metrics were found to positively correlate with perceived healthcare quality, confirming the premise that hospital evaluation systems help guide care improvements. However, this relationship became stronger and more functionally meaningful when staff competency was accounted for. Competency emerged not only as an independent predictor of healthcare quality but also as a mediating variable that explained a significant proportion of the effect exerted by performance metrics on care outcomes.

These findings confirm that while China's hospitals increasingly adopt structured performance metrics, true improvement occurs when these indicators are supported by a skilled and knowledgeable workforce. Performance systems without competence lead only to surface compliance, whereas competency allows metrics to transform into procedural precision, faster response cycles, improved safety behaviour, and better treatment reliability. Thus, the results underscore that quality rises most effectively where metrics and staff capability operate together rather than separately.

Discussion

Findings demonstrate that performance metrics improve healthcare quality in Chinese public hospitals, but not independently or in isolation. Metrics establish organisational expectations, shape behavioural norms, drive accountability, and create measurable indicators for hospitals to assess service output. However, the data clearly show that metrics alone cannot guarantee clinical transformation unless healthcare staff possess the competence

required to translate numeric targets into meaningful bedside practice. In other words, metrics provide the direction, but competency provides the engine for movement.

The mediation results confirm that staff competency is the critical mechanism through which evaluation frameworks produce observable improvements in quality of care. Hospitals with strong performance systems but weak training may exhibit compliance only at the documentation level, meeting administrative targets without reducing clinical error or improving recovery time. This implies that indicators can be achieved superficially - charts may look organised, reports timely, and audit scores acceptable - but patient outcomes remain stagnant if staff are not equipped with the skills to execute protocols precisely. Such environments foster *metric satisfaction without care transformation*.

Conversely, competency-rich hospitals demonstrate the opposite effect. When healthcare workers possess procedural expertise, diagnostic reasoning, teamwork ability, and communication precision, they are more capable of applying performance expectations to real patient scenarios. Evaluation indicators become actionable guidelines rather than bureaucratic requirements. Competency-driven teams respond more effectively during emergencies, adapt to new technologies, follow safety pathways accurately, and deliver patient-centered care with technical confidence. The result is not only improved compliance with metrics but also measurable elevation in service quality, patient trust, and outcome reliability.

These results reinforce theoretical arguments that performance measurement must be embedded within a broader capability-building ecosystem. If evaluation frameworks are implemented without parallel investment in workforce development, they risk becoming checklist systems rather than engines of improvement. The study therefore aligns with contemporary quality management literature, suggesting that hospitals achieve sustained advancement only when measurement and mastery coexist. In practical terms, KPI monitoring, digital reporting, and administrative scoring should be paired with continuous professional education, simulation-based skills upgrading, knowledge sharing workshops, and mentorship models.

This integrated approach ensures that metrics do not remain symbolic, but become operational drivers of excellence, improving care delivery at clinical, procedural and interpersonal levels. Ultimately, the findings confirm that performance systems may guide, but competency transforms - and it is the interaction between the two that generates real quality advancement in China's public hospitals.

Conclusion

Performance metrics positively influence healthcare quality in Chinese public hospitals, yet the findings of this study demonstrate that metrics alone are insufficient in driving sustainable improvement. Their impact becomes substantially more meaningful when staff competency functions as an active mediating force. Competent healthcare professionals are better positioned to interpret evaluation indicators accurately, execute procedural requirements effectively, and adapt clinical interventions with confidence. When workforce skills are high, performance metrics transition from mere administrative scorekeeping to actionable quality drivers that meaningfully impact patient outcomes, safety indicators, and service reliability.

This study therefore reinforces that quality improvement is most effective when performance measurement and workforce capability operate in tandem rather than as parallel, disconnected systems. Evaluation mechanisms establish expectations, but competency transforms those expectations into clinical reality. Public hospitals that invest in skills training, simulation-based assessments, continuous professional development, and competency-linked incentives demonstrate higher quality outcomes and more efficient service delivery. The mediated effect revealed through statistical modelling confirms that strengthening the clinical workforce amplifies the benefits of performance metrics - ensuring that improvement is operational, measurable, and patient-centered rather than procedural or symbolic.

The implication for policy and management is clear: performance measurement frameworks must be accompanied by structured competency-building strategies if public hospitals in China are to maintain high-quality care amidst rising patient demand, technological transformation, and increasing clinical complexity. By embedding staff development within evaluation reform, healthcare administrators can cultivate a workforce that not only meets targets but elevates them into meaningful improvements in patient safety, treatment outcomes, and hospital efficiency. Ultimately, the pathway to sustained care quality lies not only in defining what should be done, but in equipping people with the skill to do it well.

Conflicts of Interest

The authors declare that there are no conflict of interest in this manuscript.

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