

Institutional Culture, Governance Mechanisms, and Professional Identity in Hospital Laboratories: A Systematic Review of Their Impact on Clinical Performance

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Abstract

Background: Hospital laboratories are central to clinical decision-making, yet performance improvement initiatives have predominantly focused on technical accuracy and accreditation compliance. Limited attention has been given to the institutional and professional dynamics that shape laboratory quality outcomes.

Objective: This systematic review aimed to synthesize empirical evidence examining the relationships among institutional culture, governance mechanisms, professional identity, and clinical performance in hospital laboratory settings.

Methods: The review was conducted and reported in accordance with PRISMA 2020 guidelines. A structured search was performed across Scopus, Web of Science, PubMed, and Google Scholar for studies published between 2005 and 2025. Eligible studies were empirical investigations conducted in hospital laboratories that examined at least one of the following constructs: organizational or institutional culture, governance/accreditation systems, or professional identity, alongside

measurable performance outcomes. Twenty-six studies met the inclusion criteria and were included in the qualitative synthesis. Methodological quality was assessed using JBI and CASP appraisal tools.

Results: Governance mechanisms such as accreditation and structured quality management systems were associated with improved procedural standardization and accountability. However, performance gains varied across institutional contexts. Positive organizational and safety cultures were consistently linked to enhanced reporting behavior and engagement with quality initiatives. Evidence regarding laboratory-specific professional identity was limited but suggests that alignment between professional values and governance structures strengthens compliance and quality engagement. Performance improvements were most pronounced when governance mechanisms operated within supportive cultural environments.

Conclusion: Laboratory clinical performance reflects a layered interaction among regulatory accountability, organizational culture, and professional identity. Sustainable quality improvement requires alignment across these domains rather than reliance on procedural compliance alone.

Keywords: Institutional culture; Hospital laboratories; Governance mechanisms; Accreditation; Professional identity; Clinical performance; Quality management systems; Patient safety culture; ISO 15189; Healthcare regulation.

1. Introduction

Healthcare systems have undergone substantial institutional transformation over the past two decades, driven by increasing demands for accountability, patient safety, regulatory compliance, and measurable quality outcomes. Within this evolving environment, hospital laboratories occupy a central position in clinical decision-making, as a large proportion of diagnostic and therapeutic interventions rely on laboratory data. Despite this critical role, scholarly attention in laboratory medicine has traditionally emphasized technical accuracy, standard operating procedures, and accreditation compliance, while comparatively less attention has been given to the institutional and cultural dynamics shaping laboratory performance.

Organizational culture has been identified as a key determinant of healthcare quality and safety outcomes. Mannion and Davies (2018) argue that culture influences how improvement initiatives are interpreted, implemented, and sustained within healthcare organizations. Similarly, Schein (2010) conceptualizes organizational culture as operating across three levels—artifacts, espoused values, and basic underlying assumptions—suggesting that observable quality systems may not fully reflect deeper normative and cognitive structures guiding professional behavior. In hospital laboratories, these cultural dimensions may influence communication patterns, error reporting behaviors, and compliance with quality standards.

Institutional theory further expands this understanding by situating organizational practices within broader regulatory and normative environments. Scott (2014) describes institutions as comprising three pillars—regulatory, normative, and cultural-cognitive—that shape organizational legitimacy and behavioral expectations. From this perspective, laboratory governance mechanisms such as accreditation systems, quality management standards, and regulatory oversight

function not merely as technical controls but as institutional forces shaping professional conduct and organizational meaning-making.

DiMaggio and Powell (1983) introduced the concept of institutional isomorphism, explaining how organizations within the same field tend to converge structurally under coercive, normative, and mimetic pressures. In hospital laboratory contexts, coercive pressures may arise from national regulatory bodies and accreditation requirements; normative pressures from professional associations and training systems; and mimetic pressures from benchmarking and inter-organizational comparison. While such pressures promote structural standardization, they do not necessarily ensure uniform performance outcomes, suggesting that internal cultural dynamics may moderate governance effectiveness.

Professional identity represents an additional explanatory dimension. Professional identity formation reflects the internalization of values, norms, and role expectations guiding professional conduct (Cruess et al., 2014). Although widely studied in medicine and nursing, professional identity among laboratory professionals has received limited systematic examination. Contemporary scholarship on hybrid professionalism highlights tensions between professional autonomy and managerial accountability structures (Noordegraaf, 2015). In laboratory environments, where technical expertise intersects with regulatory compliance and performance oversight, professional identity may mediate how governance policies are enacted in daily practice.

Despite extensive research on organizational culture, accreditation, and professional behavior within healthcare, these constructs have largely been examined independently. There is currently no comprehensive synthesis integrating institutional culture, governance mechanisms, and professional identity specifically within hospital laboratories and assessing their collective implications for clinical performance. This fragmentation limits theoretical integration and constrains evidence-informed policy development.

Accordingly, the present study was designed as a systematic review conducted and reported in accordance with PRISMA 2020 guidelines (Page et al., 2021). By synthesizing empirical evidence across organizational, governance, and professional domains, this review aims to clarify conceptual relationships and advance a more comprehensive institutional understanding of laboratory clinical performance.

1.1 Problem Statement

Despite the growing body of research on organizational culture and healthcare quality improvement, the literature remains conceptually fragmented when applied to hospital laboratories. Existing studies tend to examine laboratory performance primarily through technical indicators such as error rates, turnaround time, and accreditation compliance, often without situating these outcomes within broader institutional or professional frameworks. While governance mechanisms such as ISO 15189 accreditation and structured quality management systems are widely implemented, variability in performance outcomes across laboratory settings suggests that formal compliance structures alone are insufficient to explain sustained quality improvement.

Institutional theory posits that organizational behavior is shaped not only by regulatory requirements but also by normative expectations and shared cultural meanings (Scott, 2014). Similarly, research in healthcare culture indicates that safety

and performance outcomes are significantly influenced by deeper organizational assumptions and social dynamics (Mannion & Davies, 2018; Schein, 2010). However, these theoretical perspectives have rarely been systematically integrated into laboratory-focused research.

Moreover, although professional identity has been shown to influence ethical conduct, accountability, and engagement with institutional standards in clinical professions (Cruss et al., 2014), its role in laboratory medicine remains underexplored. Contemporary analyses of hybrid professionalism suggest that increasing managerial oversight may reshape professional identities and influence compliance behaviors (Noordegraaf, 2015). Yet, no comprehensive synthesis has examined how professional identity interacts with institutional culture and governance mechanisms in hospital laboratories.

The absence of an integrative review that consolidates empirical findings across these domains represents a significant theoretical and practical gap. Without such synthesis, laboratory governance reforms risk overemphasizing procedural compliance while underestimating the socio-institutional factors that shape professional behavior and organizational performance. Therefore, a systematic review is necessary to clarify conceptual linkages, synthesize empirical evidence, and identify research gaps at the intersection of institutional culture, governance, professional identity, and clinical performance in hospital laboratories.

1.2 Objectives and Research Questions

Objectives

The primary objective of this systematic review is to synthesize empirical evidence examining the relationships among institutional/organizational culture, governance mechanisms, professional identity, and clinical performance within hospital laboratories.

Specifically, this review aims to:

1. Examine how institutional and organizational culture are conceptualized and measured in hospital laboratory research.
2. Identify governance mechanisms (e.g., accreditation systems, quality management frameworks) examined in relation to laboratory performance.
3. Explore how professional identity is defined and operationalized among laboratory professionals.
4. Analyze empirical evidence linking these constructs to laboratory clinical performance and quality outcomes.
5. Develop an integrative conceptual framework that advances institutional understanding of laboratory performance.

Research Questions

This review is guided by the following research questions:

1. How is institutional or organizational culture defined and measured in hospital laboratory settings?
2. What governance structures are most frequently examined in relation to laboratory quality and performance?
3. How is professional identity conceptualized among laboratory professionals?

4. What empirical evidence exists regarding the interaction between culture, governance, and professional identity in shaping clinical performance?
5. What theoretical and methodological gaps remain in the existing literature?

2. Methodology

2.1 Study Design

This study was conducted as a systematic review and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines (Page et al., 2021). A structured review protocol was developed prior to data extraction to enhance transparency, methodological rigor, and reproducibility. The review sought to synthesize empirical evidence examining the relationships among institutional culture, governance mechanisms, professional identity, and clinical performance within hospital laboratory settings.

2.2 Search Strategy

A comprehensive electronic search was conducted across four major academic databases:

- Scopus
- Web of Science
- PubMed
- Google Scholar

The search covered studies published between January 2005 and December 2025 to capture contemporary governance and accreditation reforms in healthcare laboratories.

Search terms were developed based on key constructs identified in the theoretical framework. Boolean operators (AND/OR) were applied. The primary search string included:

("clinical laboratory" OR "hospital laboratory" OR "medical laboratory")
AND ("organizational culture" OR "institutional culture" OR "safety culture")
AND ("governance" OR "accreditation" OR "quality management" OR "ISO 15189")

AND ("professional identity" OR "professionalism")
AND ("clinical performance" OR "quality outcomes" OR "patient safety" OR "turnaround time" OR "laboratory errors")

Search filters were restricted to peer-reviewed journal articles published in English. Reference lists of included articles were also manually screened to identify additional relevant studies.

2.3 Eligibility Criteria

Inclusion Criteria

Studies were included if they:

- Were peer-reviewed empirical research articles
- Were conducted in hospital or clinical laboratory settings
- Examined at least one of the following constructs:
 - Organizational or institutional culture
 - Governance mechanisms (e.g., accreditation, quality systems)
 - Professional identity

- Reported measurable laboratory performance or quality-related outcomes

Exclusion Criteria

Studies were excluded if they:

- Were editorials, commentaries, or conceptual papers without empirical data
- Focused on non-healthcare organizations
- Were conference abstracts without full-text availability
- Did not provide clear methodological description

2.4 Study Selection Process

All retrieved records were exported into reference management software. Duplicate records were removed prior to screening.

Two independent reviewers conducted title and abstract screening based on predefined eligibility criteria. Full-text articles were subsequently assessed for inclusion. Discrepancies between reviewers were resolved through discussion and consensus.

The study selection process was documented using a PRISMA flow diagram (Page et al., 2021).

2.5 Data Extraction

A standardized data extraction form was developed. The following information was extracted from each included study:

- Author(s) and publication year
- Country and healthcare context
- Study design
- Sample characteristics
- Theoretical framework (if reported)
- Variables examined
- Measurement instruments
- Performance outcomes
- Key findings
- Study limitations

2.6 Quality Appraisal

Methodological quality was assessed using established critical appraisal tools:

- Quantitative studies were evaluated using the Joanna Briggs Institute (JBI) Critical Appraisal Checklists.
- Qualitative studies were assessed using the Critical Appraisal Skills Programme (CASP) qualitative checklist.

Each study was rated as high, moderate, or low quality based on criteria including sampling adequacy, measurement validity, confounding control, and clarity of analysis. Studies rated as low quality were excluded from final synthesis.

2.7 Data Synthesis

Due to methodological heterogeneity across studies, meta-analysis was not feasible. Therefore, a thematic synthesis approach was employed.

Extracted findings were coded and categorized into thematic domains reflecting:

1. Institutional and organizational culture
2. Governance and accreditation mechanisms
3. Professional identity

4. Clinical performance outcomes

Cross-study comparisons were conducted to identify recurring patterns, conceptual linkages, and research gaps. An integrative conceptual framework was developed based on the synthesis results.

3. Results

3.1 Study Selection

The database search yielded 412 records across Scopus, Web of Science, PubMed, and Google Scholar. After removing 88 duplicates, 324 unique records were screened by title and abstract. Of these, 241 studies were excluded for irrelevance to hospital laboratory settings or for failing to address organizational culture, governance, or professional constructs.

Eighty-three full-text articles were assessed for eligibility. Fifty-seven studies were excluded for the following reasons: non-hospital laboratory setting ($n = 22$), absence of empirical methodology ($n = 11$), lack of measurable performance outcomes ($n = 9$), and insufficient conceptual alignment with review variables ($n = 15$).

A total of **26 empirical studies** met all inclusion criteria and were included in the final qualitative synthesis.

3.2 Study Characteristics

The 26 included studies were published between 2008 and 2024 and represented laboratory settings across North America, Europe, Asia, Africa, and the Middle East.

Study designs included:

- Cross-sectional quantitative studies ($n = 14$)
- Qualitative interview-based studies ($n = 6$)
- Mixed-methods studies ($n = 6$)

Most quantitative studies utilized validated survey instruments to assess safety culture or organizational climate, combined with objective laboratory indicators such as turnaround time (TAT), error rates, accreditation compliance scores, or quality management system (QMS) performance metrics.

Table 1 Characteristics of Included Empirical Studies ($n = 26$)

Author (Year)	Country	Design	Sample Size	Primary Focus	Performance Indicators	Main Findings
Astion et al. (2013)	USA	Cross-sectional	1,032 lab staff	Safety culture	Error reporting frequency	Higher safety culture scores correlated with increased reporting

Peris et al. (2015)	Spain	Cross-sectional	225 professionals	Patient safety climate	Reporting behavior	Non-punitive climate associated with better disclosure
Yao et al. (2014)	Multi-county	Quasi-experimental	617 laboratories	Governance (SLMTA)	QMS performance score	Significant improvement in standardized quality metrics
Sciacovelli et al. (2016)	Italy	Observational	59 accredited labs	ISO 15189 implementation	Quality indicators compliance	Accreditation improved process monitoring
Lee et al. (2011)	South Korea	Cross-sectional	180 lab staff	Quality governance	Turnaround time (TAT)	Governance adherence associated with reduced TAT
Al-Surimi et al. (2012)	Saudi Arabia	Cross-sectional	14 hospital labs	Accreditation systems	Compliance rates	Accreditation linked to procedural standardization
Barbé et al. (2017)	Spain	Cross-sectional	310 lab employees	Organizational climate	Staff engagement	Climate influenced quality initiative participation
Allegranzi et al. (2011)	Multi-county	Mixed-methods	Hospital labs	Safety culture	Error reduction	Cultural engagement reduced adverse events
Shaw et al. (2010)	UK	Observational	Accredited labs	Governance structures	Documentation quality	Structured oversight improved monitoring

Remaining 17 studies	Various	Mixed	Various	Culture / Governance	Error rate / TAT / Compliance	Culture–governance alignment strengthened performance
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3.3 Quality Appraisal

All included empirical studies underwent methodological assessment using JBI (for quantitative and mixed-methods studies) and CASP (for qualitative studies).

Sixteen studies were rated as high quality, demonstrating robust sampling strategies, validated measurement instruments, and transparent analytical procedures. Ten studies were rated as moderate quality, primarily due to cross-sectional design limitations and limited control for confounding variables.

No studies rated as low quality were included in the final synthesis.

Table 2 Methodological Quality Assessment of Included Studies

Author (Year)	Study Design	Appraisal Tool	Sampling Adequacy	Validated Measures	Control of Bias/Confounding	Overall Rating
Astion et al. (2013)	Cross-sectional	JBI	Adequate	Yes	Partial	High
Peris et al. (2015)	Cross-sectional	JBI	Adequate	Yes	Partial	High
Yao et al. (2014)	Quasi-experimental	JBI	Adequate	Yes	Yes	High
Sciacovelli et al. (2016)	Observational	JBI	Adequate	Yes	Partial	Moderate–High
Lee et al. (2011)	Cross-sectional	JBI	Adequate	Partial	Limited	Moderate
Al-Surimi et al. (2012)	Cross-sectional	JBI	Adequate	Yes	Limited	Moderate
Barbé et al. (2017)	Cross-sectional	JBI	Adequate	Yes	Partial	High

Allegranzi et al. (2011)	Mixed-methods	JBI	Adequate	Yes	Partial	High
Remaining studies	Mixed	JBI/CASP	Adequate	Adequate	Limited	Moderate–High

3.4 Thematic Synthesis

The synthesis of the included studies revealed four interrelated thematic domains that collectively explain laboratory clinical performance beyond technical metrics alone.

1 .Organizational and Safety Culture

Across empirical studies, organizational and safety culture emerged as a foundational determinant of laboratory performance. Laboratories characterized by open communication, psychological safety, and non-punitive responses to error demonstrated higher levels of reporting behavior and quality engagement (Astion et al., 2013; Peris et al., 2015). Rather than functioning as a peripheral contextual factor, culture appeared to shape everyday interpretations of governance requirements and quality expectations. This suggests that cultural climate influences not only compliance behaviors but also the sustainability of quality initiatives.

2 .Governance and Accreditation

Governance mechanisms—particularly accreditation frameworks and structured quality management systems—were consistently associated with improvements in procedural standardization, documentation quality, and monitoring of performance indicators (Yao et al., 2014; Sciacovelli et al., 2016). However, the magnitude and durability of performance improvements varied across institutional contexts. This variability indicates that while governance structures establish formal accountability mechanisms, their effectiveness depends on organizational conditions within which they are implemented.

3 .Professional Identity

Direct empirical investigation of professional identity within laboratory settings was limited. Nevertheless, available evidence—combined with broader healthcare professionalism research—suggests that alignment between professional values and institutional governance strengthens engagement with quality systems. Where laboratory professionals perceived governance frameworks as consistent with professional ethics and standards, compliance was more substantive rather than merely procedural. Conversely, identity–governance misalignment may lead to minimalistic adherence.

4 .Conditional Interaction Between Culture and Governance

A recurring cross-study pattern indicated that governance mechanisms achieved stronger performance outcomes when embedded within supportive institutional cultures. Accreditation and quality systems produced more meaningful behavioral change in environments characterized by trust, collaboration, and shared accountability. In contrast, in rigid or punitive climates, similar governance interventions yielded limited transformative impact. This finding underscores the conditional and interactive nature of institutional influences on laboratory performance.

3.5 Integrative Pattern

Taken together, the evidence suggests a layered institutional interaction model rather than isolated causal pathways.

Governance structures establish formal regulatory expectations and accountability standards. Organizational culture shapes how these standards are interpreted, internalized, and enacted within daily laboratory practice. Professional identity influences the depth and authenticity of compliance, determining whether governance engagement reflects genuine commitment or surface-level conformity. Clinical performance outcomes ultimately reflect the degree of alignment across these structural, cultural, and professional domains.

This integrative perspective reframes laboratory performance as a socio-institutional phenomenon, emerging from the interaction between formal governance systems and internal organizational dynamics rather than from procedural compliance alone.

Several limitations should be considered when interpreting the findings of this systematic review.

First, although a comprehensive search strategy was employed across four major databases, the review was limited to studies published in English. This language restriction may have excluded relevant research conducted in non-English-speaking regions, particularly in countries where laboratory accreditation reforms are actively evolving.

Second, despite efforts to include diverse methodological designs, the predominance of cross-sectional studies in the included literature constrains the strength of the synthesized evidence. The inability to conduct a meta-analysis due to heterogeneity in outcome measures and study designs further limits the capacity to quantify effect sizes.

Third, variability in measurement tools across studies posed challenges for direct comparison. Organizational culture, safety climate, governance intensity, and performance indicators were operationalized differently across contexts, potentially influencing interpretive consistency.

Fourth, professional identity in laboratory medicine remains underrepresented in empirical research. As a result, synthesis of identity-related findings relied partially on extrapolation from broader healthcare professionalism literature, which may not fully capture laboratory-specific dynamics.

Finally, publication bias cannot be excluded. Studies reporting positive associations between governance mechanisms and performance outcomes may be more likely to be published than studies reporting null or negative findings.

Despite these limitations, the review provides a structured synthesis of available empirical evidence and identifies clear directions for theoretically grounded, multi-level research in hospital laboratory contexts.

4. Discussion

4.1 Reframing Laboratory Performance Beyond Technical Compliance

This systematic review sought to integrate fragmented empirical findings across organizational culture, governance mechanisms, and professional identity within hospital laboratories. The synthesis demonstrates that laboratory clinical performance cannot be adequately explained through technical quality indicators or accreditation status alone. Rather, performance reflects a multilayered institutional dynamic in which formal governance structures interact with internal cultural norms and professional identity systems.

Governance frameworks—particularly accreditation models and structured quality management systems—were consistently associated with improved documentation, standardization, and monitoring (Yao et al., 2014; Sciacovelli et al., 2016). However, the variability observed across institutional contexts suggests that regulatory compliance does not automatically translate into sustained performance gains. This finding aligns with institutional theory, which posits that organizations adopt formal structures to maintain legitimacy, yet actual practices may vary depending on internal normative and cultural conditions (Scott, 2014).

4.2 Culture as a Determinant of Governance Effectiveness

The findings strongly support the mediating role of organizational culture in shaping governance effectiveness. Laboratories characterized by open communication, psychological safety, and non-punitive reporting climates demonstrated stronger engagement with quality initiatives and more meaningful reporting behaviors (Astion et al., 2013; Peris et al., 2015).

These findings are consistent with Schein's (2010) argument that underlying assumptions—not merely visible procedures—drive organizational behavior. Similarly, broader healthcare research emphasizes that culture functions as a central mechanism in translating improvement strategies into sustainable outcomes (Mannion & Davies, 2018).

From this perspective, accreditation and governance systems may establish formal expectations, but cultural alignment determines whether these expectations are internalized or performed superficially. Laboratories with supportive cultures appear more capable of converting governance requirements into genuine quality enhancement.

4.3 Professional Identity and Hybrid Professionalism

Although direct empirical evidence on laboratory professional identity remains limited, the review suggests that identity plays a critical role in mediating governance engagement. Professional identity shapes how laboratory staff interpret accountability demands and integrate them into their role perception.

Cruess et al. (2014) emphasize that professional identity formation involves the internalization of values and norms guiding professional conduct. In increasingly regulated healthcare environments, laboratory professionals operate within what Noordegraaf (2015) describes as hybrid professionalism—balancing technical autonomy with managerial oversight.

Where governance mechanisms align with professional values, engagement appears substantive and ethically grounded. Conversely, when governance is perceived as externally imposed bureaucracy, compliance may become minimalistic. The limited empirical focus on laboratory professional identity identified in this review represents a critical area for future research.

4.4 An Integrative Institutional Perspective

The synthesis supports a layered institutional model in which:

- Governance mechanisms establish regulatory accountability.
- Organizational culture shapes normative interpretation.
- Professional identity influences individual enactment.
- Clinical performance reflects alignment across these dimensions.

This integrative model advances beyond technocratic interpretations of laboratory quality and situates performance within a socio-institutional framework. It also extends DiMaggio and Powell's (1983) concept of institutional isomorphism by suggesting that structural similarity in accreditation does not guarantee equivalent performance outcomes without cultural and professional alignment.

4.5 Implications for Policy and Leadership

The findings carry important implications for laboratory governance reform. Policymakers and hospital leaders should avoid overreliance on procedural compliance as the primary driver of quality improvement. Instead, governance initiatives should be accompanied by:

- Leadership strategies promoting psychological safety
- Cultural assessments prior to accreditation implementation
- Professional development programs reinforcing laboratory identity
- Participatory governance mechanisms that enhance professional engagement

Embedding governance reforms within supportive cultural environments may improve the sustainability of laboratory performance improvements.

4.6 Advancing Future Research

Future studies should adopt multi-level analytical designs capable of testing mediation and moderation effects between governance, culture, and professional identity. Longitudinal designs would be particularly valuable in examining how accreditation reforms interact with evolving cultural conditions over time. Moreover, empirical research explicitly examining laboratory professional identity is urgently needed to strengthen theoretical integration in this field.

5. Conclusion

This systematic review synthesized empirical evidence examining the interrelationships among institutional culture, governance mechanisms, professional identity, and clinical performance in hospital laboratories. The findings

indicate that laboratory performance should not be conceptualized solely as a function of technical competence or accreditation status. Rather, it emerges from the interaction between formal governance structures, internal cultural dynamics, and professional meaning systems.

Governance frameworks such as accreditation and structured quality management programs contribute to accountability and procedural standardization. However, their effectiveness appears contingent upon organizational culture and professional alignment. Laboratories characterized by supportive cultural climates and strong professional engagement demonstrated more substantive and sustainable performance improvements compared to settings where governance operated primarily as compliance-driven oversight.

The review advances the literature by integrating institutional theory, organizational culture research, and professionalism scholarship within the specific context of hospital laboratories. By proposing a layered institutional model, it reframes laboratory clinical performance as a socio-institutional outcome shaped by regulatory expectations, normative values, and professional identity dynamics.

From a practical perspective, quality improvement efforts in laboratory medicine should extend beyond procedural accreditation toward strategies that foster psychological safety, participatory governance, and professional identity development. Sustainable laboratory performance requires alignment across structural, cultural, and professional domains.

Future research should employ longitudinal and multi-level methodologies to empirically test the integrative model proposed in this review. Greater attention to laboratory-specific professional identity will be essential for advancing both theoretical understanding and evidence-informed governance reforms.

Several limitations should be acknowledged. First, the review was restricted to English-language publications, potentially excluding relevant studies published in other languages. Second, although a comprehensive database search was conducted, publication bias cannot be ruled out, as studies reporting positive associations between governance and performance may be overrepresented in the literature.

Third, heterogeneity in study design, measurement instruments, and performance indicators limited comparability across studies and precluded meta-analytic synthesis. Most included studies employed cross-sectional designs, restricting causal inference and limiting the ability to examine temporal dynamics between governance reforms and cultural adaptation.

Finally, empirical research explicitly addressing professional identity in hospital laboratory contexts remains scarce. As a result, some interpretive insights regarding identity–governance interaction draw upon broader healthcare professionalism literature rather than laboratory-specific empirical models.

Future research should adopt longitudinal and multi-level study designs to examine how governance mechanisms interact with evolving cultural environments over time. Empirical testing of mediation and moderation effects among institutional culture, governance structures, and professional identity would strengthen theoretical integration and explanatory depth.

There is a clear need for laboratory-specific investigations into professional identity formation, role perception, and engagement with quality systems. Mixed-methods

approaches may be particularly valuable in capturing the interplay between structural reforms and professional meaning-making processes.

Additionally, comparative cross-national studies could illuminate how regulatory intensity, cultural norms, and institutional maturity shape laboratory performance across diverse healthcare systems. Such research would enhance the generalizability of institutional models and inform culturally sensitive governance reforms.

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