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Cost Containment Strategies and Their Impact on Hospital Financial Performance in Saudi Arabia

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Table of Contents

1. Introduction	3
2. Statement of the Problem	5
3. Importance of the Study	7
4. Objectives of the Study	9
5. Research Questions	10
6. Research Hypotheses	11
7. Previous Studies	12
8. Theoretical Framework	16
9. Research Methodology	18
10. Study Tools	19
11. Scope and Limitations	20
12. References	21

1. Introduction

Healthcare services across the world are facing unprecedented financial challenges due to factors such as the increasing demand for healthcare services, the increasing age factor among the population, advancements in technology, and the increasing cost of operation. These challenges have taken a new dimension in Saudi Arabia as the country tries to achieve its Vision 2030 transformation program, which includes transforming the country's economy from its reliance on oil-based revenues while improving the quality of service delivery in healthcare services, among other sectors. As revealed by Alasiri & Mohammed (2022), the Saudi Health Sector Transformation Program, which was initiated in 2021, includes the provision of healthcare services in a more financially sustainable and accountable way, with cost management in hospitals being a core part of the process.

Hospital expenditure can be viewed as one of the largest and most complex areas of national healthcare expenditure. According to Al-Hanawi et al. (2023), Saudi Arabia contributed to approximately 60% of the total population and healthcare expenditure in the GCC region in 2022; furthermore, healthcare expenditure contributed to merely 15% of the total government expenditure. However, there are substantial inefficiencies in the public and private sectors of hospital expenditure. A study conducted on the MOH's 91 hospitals using the DEA methodology revealed that most MOH hospitals were found to be operating at a level below optimal technical efficiency (Alshehri et al., 2023).

Moreover, the looming implementation of the National Health Insurance (NHI) model under the Health Sector Transformation Program signals a major change in the Kingdom's healthcare financing system. This shift essentially alters the financial relationship between the payer and provider, shifting away from direct governmental funding to a more strategic purchasing model (Health

Sector Transformation Program, 2022). This new world requires hospitals to adopt a tight cost containment strategy to be able to survive a competitive reimbursement system (Al-Hanawi et al., 2023). It was not a preference but a matter of survival for hospitals to change the structural decoupling of provision service from governmental funding."

In the hospital setting, cost containment is the ensemble of structured intervention, policies, and management practices that focus on the limitation or management of the growth of expenses in the health sector without compromising the quality of healthcare services provided. These practices include administrative restructuring, standardization, supply chain management, productivity enhancement of the workforce, technology, outsourcing, and value-based care. The implementation of cost containment practices can result in considerable cost savings, thereby improving hospital financial performance—a phenomenon that has garnered considerable attention from scholars, yet remains an unexplored area in Saudi Arabia.

The global evidence base regarding cost containment is considerable. For example, in a scoping review of integrated hospital strategies, Wackers et al. (2022) They found that hospitals that implemented quality improvement and cost management strategies did better than those that implemented either quality improvement or cost management strategies. Berwick and Hackbarth (2012) found that as much as 30% of health expenditure can be eliminated if targeted waste reduction strategies are implemented—a staggering figure for health systems around the world, including those in Saudi Arabia. However, to inform health care in Saudi Arabia, there is a need to empirically examine these international findings, which the extant literature failed to do.

This proposal for conducting the research, therefore, outlines the plan for conducting an extensive and mixed-methods investigation of the association between cost-containment approaches and financial performance in hospitals in

Saudi Arabia, based on three relevant theoretical approaches to understanding the phenomenon of sustainable cost efficiency and quality service provision in hospitals, namely Resource-Based Theory, Agency Theory, and Lean Management Theory. This study will be significant to both practice and knowledge production because of the mixed-methods approach that will be used to investigate the phenomenon of interest, where both quantitative and qualitative findings will be generated to shed light on the association of concern.

2. Statement of the Problem

The healthcare sector in Saudi Arabia is increasingly being required to provide quality healthcare services to its growing and demanding population, as well as dealing with the problem of increasing healthcare costs and preparing for a future where there will be less government subsidy for healthcare services. The population of Saudi Arabia is expected to rise to 39.5 million by mid-2030, with its elderly population expected to rise more than twice its present figure (Alasiri & Mohammed, 2022). This has led to an ever-increasing demand for healthcare due to non-communicable diseases.

In this setting, many hospitals in Saudi Arabia are characterized by considerable technical and allocative inefficiencies. Alatawi et al. (2022) pointed to a number of systemic barriers to cost-effective management, including a lack of effective health information systems, fragmented reporting, and a lack of capacity for data-based decision-making. Additionally, the absence of standard costing systems (Standard Costs) in many hospitals makes it nearly impossible for financial managers to accurately calculate the cost-to-value ratio of specific clinical procedures, thus generating considerable operational waste.

In addition, the Saudi healthcare system is in the midst of a revolutionary shift in the global healthcare arena, moving away from global budgets toward an activity-based reimbursement system, known as Diagnosis Related Groups

(DRGs). This is fundamentally changing the relationship between the payer and the provider, moving toward a model known as Strategic Purchasing. Hospitals that fail to align their internal cost structure with fixed reimbursement rates will face substantial fiscal deficits. This is particularly problematic, as the institutional structure does not have the advanced cost strategy skills necessary to support the new National Health Insurance directives.

Although some attention has been given to the private sector with regard to internal controls (Al Rahahleh et al., 2023), there is a crucial gap with regard to specific cost containment strategies which influence financial outcomes in Saudi Arabia. There is a notable gap with regard to empirical research on cost containment strategies adopted within both the public sector and the private sector, which are actually influencing financial sustainability indicators and cost efficiency metrics.

Consequently, policymakers and hospital administrators are forced to make strategic decisions based either on anecdotal evidence or models imported from Western societies that are not likely to account for the singularities of the health system in Saudi Arabia in its transformation phase. The overall objective of this study is to examine the following central research problem: To what extent do cost containment strategies adopted by Saudi hospitals contribute to financial sustainability?

3. The Study Importance

3.1 Scholarly Contribution

The majority of the research on cost containment strategies in hospitals is based on the experiences of the United States, the United Kingdom, and Western European countries, whose environments, financial systems, and cultural backgrounds differ significantly from the Kingdom of Saudi Arabia. The research extends the applicability of the Resource-Based View theory and the Agency Theory to the Middle Eastern culture, adding value to the theories. The study of the relationship between cost containment strategies and quality was need for theory-informed approaches (Bal and Wallenburg ,2023).

3.2 Policy Relevance

The findings of this study are expected to have direct implications for health financing policies in Saudi Arabia at different levels. In fact, the Saudi Ministry of Health, the Council for Health Insurance, the Saudi Central Board for Accreditation of Healthcare Institutions (CBAHI), and the National Centre for Privatisation and PPP need evidence to support the ongoing corporatization of public hospitals, the extension of mandatory health insurance, and the establishment of public-private partnerships. In fact, Al-Hanawi et al. (2023) highlight that “the healthcare system reform in Saudi Arabia, as indicated in the Vision 2030 plan, requires a fundamental transformation in the way healthcare services are delivered in the kingdom, shifting to a value-based care system with more involvement of the private sector; this can only be achieved through evidence of effective cost-containment strategies.”

3.3 Managerial Implications

Hospital administrators and CFOs stand to gain from the guidelines that this research will provide. This is because the research will be able to point out the most effective strategies given different conditions, and this will be helpful in prioritizing efforts towards improving conditions and developing internal competencies to support financial efficiency. This is especially so given the findings of Dubas-Jakobczyk et al. (2021) that the link between financial performance and quality of care in hospitals is not straightforward and linear.

3.4 Alignment with Vision 2030

Moreover, the Health Sector Transformation Programme under the Saudi Vision 2030 explicitly includes efficiency improvement, financial sustainability, and expansion of the private sector as its main goals for healthcare development. This study would directly contribute to the achievement of these goals as it would offer the evidence base for the transformation of the way hospital finances are currently being managed in the country, as well as contributing to the achievement of the target for the expansion of the private sector to account for 35% of total healthcare provision in the country.

"Specifically, this study assumes center stage in the move towards the 'Corporatization' model, whereby public hospitals are grouped in Accountable Care Organizations (ACO) known as Health Clusters. As the clusters move towards financial independence in the framework of the Health Holding Company, the ability to execute cost control measures is the central determinant of the operational survival/self-sufficiency of the clusters."

4. Objectives of the Study

The study seeks to realize the following specific objectives:

- To identify and categorize cost containment strategies implemented by Saudi Arabian hospitals, including administrative, clinical, supply chain management, and technology-driven cost containment strategies.
 - To assess the level of implementation and perceived efficiency of cost containment strategies from the perspectives of financial managers and administrators.
 - To examine the influence of cost containment strategies on financial performance using a set of efficiency ratios (e.g., cost per patient day) and sustainability ratios (e.g., revenue efficiency, operating margins). To examine the moderating effect of hospital type (public, private, health clusters), size, and geographic locations on the relationship between cost containment strategies and financial performance.
 - To identify institutional, regulatory, and managerial factors hindering the implementation of cost containment strategies, including issues related to fragmented information systems and change management.
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- To formulate a conceptual framework for enhancing financial performance based on a set of evidence-based recommendations specific to the healthcare sector in Saudi Arabia.
 - To formulate evidence-based recommendations for enhancing operational efficiency based on the Health Sector Transformation Program.
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5. Research Questions

This study is guided by the following set of primary and secondary research questions:

5.1 Primary Research Question

What is the relationship between cost containment strategies and financial performance in Saudi Arabian hospitals and what moderating effects do institutions, managers and contexts have on this relationship?

5.2 Secondary Research Questions

1. What are the current cost containment strategies used in public and private hospitals of Saudi Arabia, and to what extent they are used in the areas of administrative, clinical, supply chain, and technology?
2. What impact do the current cost containment strategies have on various aspects of financial performance of the hospitals of Saudi Arabia, such as operating cost ratio, cost per patient days, and net profit margin?
3. Does the type, size, and location of the hospital have a significant impact in relation to the cost containment strategy and its impact on hospital financial performance?
4. What are the primary institutional, regulatory, and managerial barriers to effective cost containment implementation in the Saudi hospital sector, and how do they differ between public and private hospitals?
5. How do hospital managers and financial officers perceive the effectiveness of existing cost containment initiatives, and what organisational capabilities are most associated with successful implementation?
6. What evidence-based policy and managerial recommendations can be derived from comparative analysis of high-performing and low-performing hospitals in terms of cost efficiency?

6. Research Hypotheses

6.1 Main Hypotheses

H1: Impact of cost containment strategies on financial sustainability of Saudi hospitals is statistically significant but controlling for hospital geographic location, type and size.

H2: A significant positive association between operational efficiency (e.g., budget variance and resource utilization) and administrative cost containment strategies in Saudi hospitals.

H3: There is a positive association between clinical cost containment strategies and reduced cost per patient day and better resource utilization in Saudi hospitals.

H4: A positive association between reduced pharmaceutical, supply chain optimization strategies and medical supply costs.

H5: Technology-based cost containment strategies have a positive association with Revenue Cycle Management (RCM) and financial sustainability.

6.2 Moderating Hypotheses

- H6: Hospital type, i.e., public, private, and health cluster, is significant in moderating the association between cost containment strategies and financial performance; the association is stronger in the case of private hospitals.
- H7: Hospital size moderates the association between Economies of Scale and cost containment strategies, where the association is stronger in the case of larger hospitals.
- H8: A significant weaken in positive association of cost containment strategies and financial performance when institutional and regulatory barriers such as readiness to adapt to DRG and information system fragmentation.

- H9: Interaction Hypothesis between technology-based strategies and clinical cost containment initiatives has been synergistically effect on financial performance from sum of each strategy's individual contribution as applied separately.

7. Previous Studies

The literature on cost containment and hospital financial performance is extensive, but geographically focused. The review below is a synthesis of four main thematic areas, prioritizing recent and methodologically sound research.

7.1 Hospital Efficiency and Cost Management in Saudi Arabia

Hospital Efficiency and Cost Management in Saudi Arabia

In the post-Vision 2030 era, important research papers have been published regarding the efficiency of hospitals in Saudi Arabia. Alshehri et al. (2023) conducted a study in which the authors used the Casemix Index method for measuring the allocation of resources and the efficiency of government hospitals in Saudi Arabia. They employed the DEA method to measure the efficiency of 91 hospitals from the Ministry of Health. They concluded that the average efficiency score was below the frontier, indicating that cost savings could be achieved through better management practices without additional resource allocation.

In one of the most thorough qualitative examinations of public hospital efficiency in Saudi Arabia, Alatawi et al. (2022) utilized stakeholder interviews conducted at various locations of the MOH across the country, where it was found that the following factors contribute to the inefficient management of the public hospitals of Saudi Arabia: the low quality of the health information systems, coordination between departments, performance management, and clinical governance. Significantly, the study found that the effectiveness of

integrated reporting systems and data management in hospital settings is correlated with improved resource utilization, highlighting the role of information technology in the effectiveness of cost containment strategy.

With regard to the private sector, Al Rahahleh et al. (2023) conducted research on the financial performance of 78 private hospitals in Saudi Arabia, using "Agency Theory" as the theoretical background and "Partial Least Squares Structural Equation Modeling" (PLS-SEM) as the research tool. The research findings indicated that "internal control mechanisms" and "financial accountability structures" have positive direct and indirect effects on financial performance, with "financial accountability" as a partial mediator. This implies that "cost management tools" at the "governance level" rather than "operational level" could be essential prerequisites for improving financial performance in private hospitals in Saudi Arabia.

Rahman (2020) studied the privatisation process of the healthcare system in Saudi Arabia, which has undergone a significant structural change from a mainly state-dominated system towards a mixed system through Vision 2030. He noted that there are cost control incentives through privatisation, which can create a widening gap in access and quality if not supplemented by effective regulation—a challenge that has direct implications for cost control strategies in hospitals in Saudi Arabia.

7.2 Lean Management and Cost Containment

Lean management, which is based on the Toyota production system, has been recognized as one of the most researched cost containment approaches in health care facilities around the world. The implementation of lean management in health care facilities from 2019 to 2024 was supported the cost-effectiveness and efficiency of lean management which increases patient volume by 15 to 68.9% reduce length of stay and decrease operational costs (Kaur et al. ,2024).

Rundall et al. (2021) presented national-level evidence in the form of a study conducted in US hospitals, demonstrating the positive relationship between the implementation of lean management and the improvement of various aspects, such as financial indicators, with the benefits rising in line with the extent and length of implementation. As an alternative study to the above, Ayaad et al. (2022) presented evidence in the form of the direct application of the principles of lean management in the context of oncology hospital environments, highlighting the positive impact on the improvement of aspects such as service quality, cost, and time management, particularly in the context of the rising demand for cancer treatments in Saudi Arabia.

In a similar synthesis, Wackers et al. (2022) conducted a review of 19 international case studies of hospitals that successfully bent the cost curve while improving quality, concluding that lean management approaches, Six Sigma, and value-based healthcare were the most used management approaches in these successful hospitals. An important element that led to the successful cost containment of these top-performing hospitals was the integration of cost management strategies with value creation strategies, a perspective that is supported by Porter (2010) and, more recently, operationalized by Bernstein et al. (2024) who emphasized that cost containment should be value-driven, not cost-cutting-oriented.

7.3 Supply Chain Optimization and Technology-Enabled Cost Reduction

Supply chain management was identified as a strategy for cost containment in hospitals. A review by de Silva Etges et al. (2022) on supply chain management concluded that supply chain optimization is a potential strategy for reducing costs, improving efficiency, and improving patient regarding cost measurement practices in value-based care settings, it was

identified that hospitals which use complex cost measurement practices, including time-driven activity-based costing, are able to achieve better cost visibility and are able to identify areas where waste can be eliminated in their supply chain. The review identified that optimisation of care paths in these hospitals resulted in cost reductions ranging from 10% to 25% in cost per episode.

The implementation of Time-Driven Activity-Based Costing is also very relevant to the Saudi market, as this system is more compatible with the objectives outlined by Vision 2030 to achieve 'fair pricing' and transparent resource allocation for the newly formed Health Clusters. The implementation of such a sophisticated costing system is no longer a preference but a necessity for Saudi hospitals to adapt to the new era of value-based reimbursement systems.

Another avenue for cost containment through the application of technology involves electronic health records (EHRs) and hospital information systems, which can help in billing accuracy, elimination of duplicate testing, and improvement in revenue cycle management. Studies have uniformly linked higher levels of digital health maturity with improved financial performance; however, there are barriers to its adoption in terms of costs and organizational readiness, especially in public sector hospitals.

7.4 Effective Healthcare Cost-Containment Policies

At the system level, Stadhouders et al. (2019) carried out a systematic review of cost-containment policies in healthcare systems in OECD countries, identifying the most effective cost management strategies at the macro level, which include 'budget caps,' 'reference pricing,' 'reforms in payment systems,' and 'co-payments.' In the context of Saudi Arabia, Al-Hanawi et al. (2023) identify the ongoing change in healthcare financing systems in the

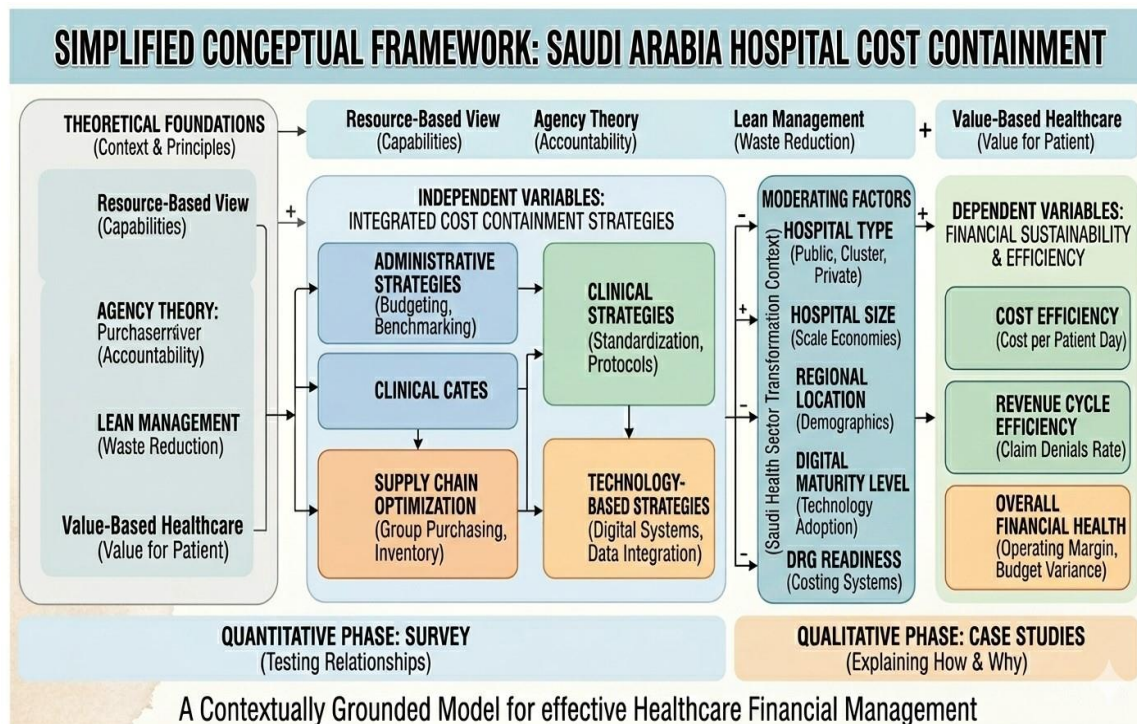
country, shifting from a fee-for-service payment system to a value-aligned payment system, which presents opportunities as well as challenges for cost management at the hospital level.

7.5 Research Gap

Yet, in spite of the growing body of literature presented above, an important research gap still remains, in that there is no methodologically rigorous study that examines the relationship between cost-containment measures and quantified measures of financial performance in a sample of Saudi Arabian hospitals, including both the public and private sectors, while controlling for institutional moderating factors, providing implications-based recommendations in the context of the Saudi Arabian culture and regulation, which is the focus of the current study. Specifically, while the extant Saudi Arabian-based research utilized DEA to measure hospital efficiencies, the current study is important in that it goes beyond the measurement of hospital performance to the explanation of hospital performance, linking cost-containment measures to financial performance measures.

8. Theoretical Framework

To examine the interrelationship between cost containment strategies and financial performance in hospitals in Saudi Arabia ; three collectively distinct theoretical approaches offer a comprehensive framework.



8.1 Resource-Based View (RBV)

Barney (1991) developed RBV theory and built on Penrose's (1959) theory of firm growth. According to the theory, organization can attain competitive advantage if they possess Valuable, Rare, Inimitable, and Non-substitutable resources (Barney, 1991). The application of the RBV theory to the hospital industry implies that financial performance outcomes are not merely the result of the application of cost containment strategies; rather, financial performance outcomes are the function of the development of differentiated resource-based competencies in hospitals that allow them to more effectively execute cost containment strategies compared to other hospitals. This explains why some hospitals with similar cost containment strategies attain very different financial outcomes (Wackers et al.,2022).

8.2 Agency Theory

A Theory developed by Jensen and Meckling (1976) to study an agent (hospital manager, etc.) and the relationship between a principal (hospital

owner, government body, etc.) who acts on his/her/its behalf. The issue of misalignment between the incentives of the principal and his/her agent is a major issue in healthcare because it might lead to cost inflation, wastefulness, etc., which might negatively impact financial performance. The theory is also shown to be relevant to the Saudi healthcare sector by Al Rahahleh et al. (2023) who found significantly correlated with better financial performance for hospitals in Saudi Arabia. Thus, the theory is yet another perspective on cost containment as a strategy for improving the financial performance of healthcare providers. "In the contemporary Saudi context, Agency Theory is particularly relevant as the Health Sector Transformation Program establishes a 'Purchaser-Provider Split.' to demonstrate financial accountability and cost-efficiency in exchange for performance-based reimbursement; hospitals (the Agents) requires a principal-agent relationship where the National Health Insurance Center (the Principal) .

8.3 Lean Management Theory

It was derived from the Toyota Production System and modified for extensive use in healthcare. It emphasizes the identification and elimination of waste as a tool for reducing costs and improving quality (Teich & Faddoul, 2013). By identifying value-added and non-value-added activities for hospitals, lean theory can be applied to a value stream approach that helps design more efficient healthcare delivery for patients. Lean theory can be considered a more appropriate theory for this study because Lean theory implementation in hospitals leads to improved efficiency, cost-effectiveness, and financial performance(Kaur et al. ,2024and Rundall et al. ,2021.)

8.4 Value-Based Healthcare (VBHC)

In addition to the aforementioned theories, Porter's (2010) Value-Based Healthcare approach changes the emphasis of healthcare cost management from input minimisation to outcome maximisation, based on the premise that "the proper definition of value creation in healthcare should be defined as the outcome of healthcare per unit of cost." This approach is becoming ever more influential in the reform of the Saudi healthcare system in terms of the 2030 Vision, inasmuch as this reform is predicated on the explicit endorsement of 'value-based care' as the "guiding principle of the Health Sector Transformation Programme" (Alasiri & Mohammed, 2022). The VBHC model supplies the normative foundation of this study's examination of the manner in which cost management strategies can be deployed to decrease healthcare costs while maintaining quality and value in the care provided within the hospital setting. "Under the Resource-Based View, this study finds 'Digital Maturity' and 'Advanced Costing Capabilities' to be resources for the organisation, and that hospitals that have integrated Hospital Information Systems and 'Nphies' enjoy a competitive advantage in terms of managing the revenue cycle and containing costs, an advantage that is difficult to replicate by others."

8.5 Proposed Conceptual Model

With a synthesis of these four theoretical perspectives, this study proposes a conceptual model wherein cost containment strategies (independent variables: administrative, clinical, supply chain, and technology-related dimensions) would have a direct relationship on hospital financial performance (dependent variable: composite index of operating cost ratio, cost per patient day, revenue efficiency, and net profit margin). Hospital types, sizes, and regulatory environments are considered as moderating variables, while organisational capabilities (resource base, governance, and lean maturity) are considered as mediating variables to partially explain the relationship between strategy

adoption and financial performance. "Specifically, the model posits that while cost containment strategies are considered as the main drivers of financial performance, this is mediated by organisational capabilities, as postulated by the Resource-Based View, and is also moderated by the institutional regulatory environment, including the maturity of 'Health Clusters' and 'DRG-based billing.' This multi-layered approach is intended to ensure a comprehensive understanding of 'how' and 'in what manner' cost containment results in financial sustainability."

9. Research Methodology

This study adopts a sequential explanatory mixed-methods research design, combining quantitative analysis in the first phase with qualitative investigation in the second. This design is optimal for examining a complex organisational phenomenon such as cost containment, where quantitative data establish the extent and direction of relationships while qualitative data illuminate the mechanisms, processes, and contextual conditions that underpin them. The approach is also consistent with the methodological model used successfully in the financial performance study of Saudi hospitals conducted by Al Rahahleh et al. (2023).

9.1 Phase 1: Quantitative Cross-Sectional Survey

For the quantitative study, the cross-sectional survey approach will be used, in which the sample will comprise financial managers, hospital administrators, and chief medical officers in the stratified random sample of Saudi Arabian hospitals. The sampling frame will include the MOH hospital registry, the Saudi Health Council, the Council for Health Insurance's list of accredited hospitals, etc. Target sample size is 200 hospitals, stratified by hospital type (public, private), size (small, <100 beds; medium, 100-300 beds; large, >300 beds), and region (Central, Western, Eastern, Northern, Southern). This allows us to capture the complete diversity of the Saudi hospital landscape,

thereby making the sample more representative, while at the same time providing us with the opportunities for subgroup analysis that are essential for the evaluation of the moderating hypotheses. A structured questionnaire will be used to collect data on the adoption and implementation intensity of cost containment strategies on four dimensions; financial performance of hospitals through a composite financial index; and moderating factors through a questionnaire. The questionnaire will be based on instruments used in the international literature on the subject and will be translated to Arabic from English under the guidance of a bilingual expert. By using Smart PLS version 4 or AMOS software; both Pearson's correlation coefficient and Spearman's correlation coefficient) multiple linear regression analysis and structural equation modeling (SEM)

"To address the potential sensitivity issue of accessing clinical and financial information, the study would utilize a 'Triangulation' approach. Subjective self-reported information would be collected from senior executives of the hospitals, which has been found to be an effective method in healthcare management research when access to objective financial information is limited. Moreover, an 'Ethical Clearance' protocol would be strictly adhered to in order to ensure the anonymous nature of the research and to obtain transparent information from public as well as private sector respondents."

9.2 Phase 2: Qualitative Multiple Case Studies

The qualitative phase will involve conducting in-depth case studies on six purposively selected hospitals, three from the public sector and three from the private sector, representing diverse geographic regions as well as financial performance levels. Purposive sampling will be used in this phase; however, the sample selection will be based on the outcomes of Phase 1 to ensure maximum variation in terms of the implementation of the cost containment strategy as well as financial performance levels. This phase will also involve

conducting 3 to 5 in-depth interviews with respondents from different hospitals, such as CEOs, CFOs, quality managers, departmental heads, procurement officers, etc., from the selected hospitals. Thematic analysis will be conducted using NVivo 14 software, along with trustworthiness through member checking, thick description, peer debriefing, and reflexive practice.

10. Study Tools and Instruments

10.1 Primary Instrument: Structured Questionnaire

The questionnaire comprises five sections. Section A comprises demographic and institutional information. Section B comprises 15 questions on administrative cost containment strategies using scales developed by Al Rahahleh et al. (2023) and Wackers et al. (2022) on a five-point Likert scale (1 = Not Implemented; 5 = Fully Implemented and Formally Evaluated). Section C comprises 12 questions on clinical cost containment strategies, which include the use of clinical pathways, length of stay protocols, evidence-based prescribing practices, and quality-based incentive systems, using scales developed by Ayaad et al. (2022). Section D comprises 18 questions on supply chain and technology-based strategies using scales developed by de Silva Etges et al. (2022) and Rundall et al. (2021). Section E consists of 10 questions that test financial performance using a composite financial index, which includes objective financial ratios as well as perceptual financial health assessments, as applied in the financial performance questionnaire validated by Al Rahahleh et al. (2023). “Specifically, Section D will include questions on the integration level with national digital platforms such as NPHIES for managing the revenue cycle and NUPCO for centralized supply chain efficiencies to ensure that the tool captures the unique technological landscape of the Saudi healthcare system.”

Content validity will be ensured through expert panel review by five healthcare finance experts and three academic researchers. Construct validity will be ensured through confirmatory factor analysis. Internal reliability will be ensured through Cronbach's alpha (0.70). The discriminant validity will be ensured through Heterotrait -Monotrait (HTMT) ratio, as suggested by Henseler et al. (2015).

10.2 Secondary Financial Data

In addition to primary data, the study will also collect secondary financial data from various sources such as MOH Statistical Yearbooks, Saudi Health Information Survey, CBAHI reports, and annual reports of hospitals. The financial indicators include total operating costs, cost per patient day, bed occupancy rates, revenue per available bed, operating margin, and return on assets. The indicators include total operating costs, cost per patient day, bed occupancy rates, and Budget Variance (for public hospitals) and Operating Margins (for private hospitals). In addition to these, the study will also include Claim Denials Rate as a critical financial indicator in the current insurance-driven environment."

10.3 Semi-Structured Interview Protocol

A separate interview schedule will be created for executive, financial, clinical, and operational informant groups, which will be aligned with the conceptual model. Interview questions will include cost containment strategy adoption, implementation, organizational enablers and barriers, and perceived financial impacts. The themes will be extracted with the help of Braun & Clarke's (2022) notion of reflexive thematic analysis which focuses on the role of the researcher in creating knowledge. "Fulfilling the Saudi Personal Data Protection Law

(PDPL) requirements that all digital data will be stored in encrypted cloud folders with access limited to the primary researcher ."

11. Scope and Limitations of the Study

11.1 Scope

- Spatial Scope: All the five administrative regions in Saudi Arabia, with special focus on the major healthcare centers in Riyadh, Jeddah, Dammam, Mecca, and Medina.(Primary, Secondary, Tertiary).
- Institutional Scope: Hospitals registered with the MOH, including the Health Clusters of the Health Holding Company, private hospitals accredited by the CBAHI, and military/special sector hospitals.
- , Temporal Scope: Cross-sectional data on cost management practices and financial performance in the period 2021-2023, highlighting the post-COVID-19 healthcare financial recovery and the early stages of the implementation of the HSTP.
- Thematic Scope: The relationship between cost management practices and financial performance is the thematic scope of the study, although the quality-cost relationship is recognized, the study does not make clinical quality its dependent variable.

11.2 Limitations

Several limitations must be acknowledged. First, the cross-sectional nature of the quantitative design would not allow for causality, which would necessitate a longitudinal design to establish temporal relationships between strategy adoption and its relationship with financial performance outcomes. Second,

self-reported data for financial performance may be subject to social desirability bias, which would be reduced through the use of triangulation for secondary financial data. Third, access to detailed financial information from public hospitals may be limited due to government confidentiality regulations. Fourth, the results may not be generalizable to other GCC countries due to the unique health system structure, oil revenue-dependent financing model, and regulatory environment in Saudi Arabia. Fifth, key informant interviews in the qualitative component may be subject to impression management bias, which could result in overly positive self-presentation of cost management practices in their respective organizations.

Sixth, the quality-cost trade-off question cannot be fully addressed within its scope; that study does not examine clinical quality outcomes as a dependent variable,

Seventh: During a period of rapid institutional and regulatory transition; our study is conducted.

“The financial dynamics and cost structures may evolve potentially limiting the long-term stability of the findings beyond the current transformation phase.” As the Saudi health system moves toward full corporatization and national insurance coverage.

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