

Stakeholder-Driven Cost Management Approaches in Iranian Hospitals: A Qualitative Thematic Analysis

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Received: 11 Aug 2025

Published: 17 Dec 2025

Abstract

Background: Inflation, delayed insurance reimbursements, demographic aging, and bureaucratic inefficiency drive Iran's escalating healthcare spending, threatening hospital sustainability and universal health coverage (UHC). This study aims to identify the cost control strategies and to explore the factors that promote and impede their usage.

Methods: This qualitative descriptive study (January-June 2024) used semi-structured interviews with 80 participants. Thematic analysis followed Braun and Clarke's framework, validated via peer debriefing, member checking, and inter-coder reliability using MAXQDA software.

Results: Five themes were present: (1) Information Technology and Transparency, (2) Process and Resource Management, (3) Human Resource Management and Organizational Culture, (4) Systematic Approaches and Policy Development, and (5) Overcoming Structural and Economic Barriers. Cross-cutting concerns highlighted the importance of a cost-conscious culture, evidence-driven decision-making, market-oriented strategies, and continuous process monitoring.

Conclusion: The study outlines 11 strategic areas for Iran's healthcare, emphasizing digital transformation, workforce management, process optimization, policy reform, and structural adjustments. Findings offer practical guidance for hospital executives and policymakers in resource-constrained systems, applicable globally (e.g., Brazil, India), promoting low-cost improvements without quality compromise.

Keywords: Cost Control, Cost Containment, Process Optimization, Workforce Efficiency, Healthcare Finance, Qualitative Research, Cost Management, Hospital, Hospital Information Systems, And Health Policy

Conflicts of Interest: None declared

Funding: None

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Cite this article as: Tolouei Rakhshan S, Arab M, Mosadegh Rad AM, Harirchi I. Stakeholder-Driven Cost Management Approaches in Iranian Hospitals: A Qualitative Thematic Analysis. *Med J Islam Repub Iran*. 2025 (17 Dec);39:158. <https://doi.org/10.47176/mjiri.39.158>

Introduction

The rising costs of healthcare, a worldwide challenge for the sustainability of health systems over time, have increased significantly in hospitals (1). Aging of the population, technological advances, increased prevalence of non-communicable conditions, and rates of iatrogenesis as medical error/poor regulation result in upward pressure on

costs (2).

In particular, these dynamics are exerting pressure on hospitals' budgets—reducing the quality of care and increasing the financial fragilities, while public hospitals suffer most from this situation (3). The World Health Organization (WHO) also highlights that, to achieve UHC

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↑What is “already known” in this topic:

Rising healthcare costs globally and in Iran are driven by aging populations, technological advances, and economic pressures like inflation and delayed payments. Quantitative studies on cost-effectiveness exist, but qualitative insights from diverse stakeholders, especially in Iran's context of bureaucratic and structural challenges, remain limited.

→What this article adds:

This study provides qualitative, stakeholder-driven insights into cost management strategies in Iranian hospitals, identifying five themes and 11 categories tailored to local economic and structural issues. It offers practical recommendations for policymakers to enhance financial sustainability while maintaining care quality, filling a gap in context-specific frameworks.

(universal health coverage), innovative cost management measures are necessary as increasing costs in lower-income and middle-income countries overwhelm available finances (4).

The Iranian Ministry of Health reports that the Total Health Care Expenditure (THCE) and Governmental Health Care Expenditures (GHCE) increased by approximately 30.5% and 25.9%, respectively (5). This has occurred since inflation rates are over 30% and insurance payments are delayed. Research showed Iran's healthcare expenditures are expected to grow faster than its GDP, government revenue, and non-health expenditures by 2030 (5). Similar patterns are seen globally, with public spending increasing by 4–5% and healthcare spending increasing by 3–4% yearly in OECD nations between 2000 and 2010 (2).

Complex administrative structures, especially multi-payer funding models, are a contributing factor to operational redundancy and resource waste in Iran (6). Iranian hospitals struggle to manage costs due to rising prices, a complex government structure, and inadequate infrastructure (7). Poor cost management in hospitals means that they run financial risks, provide low-quality care, or pass the costs on to patients—all inimical to UHC goals. To ease some of the financial pressure on Iran's health system, it is essential to secure sustained delivery and maintenance of high-quality health care. This study explores stakeholder-driven cost management techniques to address these problems and offer Iranian hospitals solutions specific to their situation.

In Iran, qualitative studies of stakeholder perspectives are still rare, despite the prevalence of quantitative studies on hospital cost management, such as cost-effectiveness assessments. Existing research, which frequently concentrates on financial measures, usually ignores the subtle, situation-specific strategies employed by hospital managers (8). In other emerging economies, such as Brazil and India, literature may highlight cost-cutting and labor efficiency driven by technology. Nonetheless, it seldom delves into the economic and bureaucratic constraints specific to Iran (9, 10). Furthermore, almost all of the previous research conducted in Iran has failed to consider qualitative perspectives from a variety of stakeholders, which has limited the comprehension of realistic, grass-roots approaches (11). The qualitative method used in this study to identify stakeholder-driven cost management techniques fills this gap by providing an exhaustive framework customized for the healthcare context in Iran.

This study aims to identify and understand cost management strategies in Iranian hospitals from the perspectives of key stakeholders, including hospital executives, finance employees, and healthcare practitioners. The research questions are:

1. What techniques do stakeholders adopt to reduce hospital costs effectively?
2. How do these strategies tackle the economic and structural issues facing Iran?
3. What facilitates and what impedes the use of these strategies?

The study aims to provide policymakers and hospital

administrators with valuable insights by addressing these questions, enabling them to maintain high standards of care while ensuring the hospital's financial sustainability.

Methods

Study Design

This qualitative descriptive study, conducted between January and June 2024, used semi-structured interviews to examine cost-management procedures in Iranian hospitals. A qualitative methodology was selected to obtain comprehensive, context-specific insights from stakeholders, by the World Health Organization's health system structure, which prioritizes governance, financing, and service delivery (4). Thematic analysis, guided by Braun and Clarke's six-phase framework (familiarization, coding, theme generation, review, definition, and reporting), was employed to identify patterns and themes related to cost management strategies, their effectiveness, and implementation challenges (12). This design enabled a sophisticated comprehension of intricate, stakeholder-oriented initiatives inside Iran's healthcare system.

Participants and Sampling

Participants were recruited from public, private, and charity hospitals across Tehran. Roles included hospital managers, quality improvement managers, human resource managers, physicians, nurses, financial managers, accountants, and revenue officers, ensuring a broad range of perspectives. Additional participants were recruited from university headquarters, encompassing vice-chancelleries responsible for treatment, health, human resources, and development, along with financial and budget management, as well as representatives from the Ministry of Health and the Social Security Organization. To ensure representation across organizational roles and hospital types, purposive sampling targeted diverse stakeholders from public, private, and charity hospitals in Tehran, including urban settings with varying resource levels. However, as noted in the limitations, the sample was predominantly urban and did not include rural or severely under-resourced facilities, which may limit generalizability. Purposive and snowball sampling techniques were used for selecting a wide range of stakeholders ($n = 80$): hospital managers ($n = 30$), financial officers ($n = 25$), healthcare providers ($n = 15$), and other stakeholders ($n = 10$). The minimum requirement for years of experience in hospital management or clinical positions, as stipulated by the inclusion criteria, was four years to achieve expert knowledge on cost control. We continued data collection until saturation was achieved (confirmed after 75 interviews, followed by five additional interviews to be sure). We described the characteristics of participants in Table 1, including age, gender, education, specialism, organizational job, workplace, and years of experience. The average age was 44.5 years (range 30–70), with an average of 19.6 years of experience (range 4–45).

Data Collection

Semi-structured interviews were conducted between January and June 2024. When required, interviews (all

Table 1. Participant Demographics

Variable	Category	Frequency (n)	Percent (%)
Gender	Male	47	58.75
	Female	33	41.25
Education	PhD	34	42.50
	Master's	22	27.50
	Bachelor's	20	25.00
	General Practitioner (MD)	4	5.00
Organizational Role	Senior Manager	20	25.00
	Middle Manager	23	28.75
	Operational Manager	5	6.25
	Expert	12	15.00
	Clinical Staff	8	10.00
	Other (e.g., Faculty, Consultant)	12	15.00
Workplace Type	Public Hospital	47	58.75
	Private Hospital	15	18.75
	Charity Hospital	2	2.50
	Ministry of Health	4	5.00
	University (Other)	7	8.75
	Other (e.g., Pasteur Institute)	5	6.25

conducted in Persian, over face-to-face or secure virtual platforms) were audio-recorded and typically lasted between 45 and 60 minutes. An interview guide, pilot-tested with five participants for clarity and relevance, included open-ended questions such as "What strategies have you implemented to reduce hospital costs?" "How effective are these strategies?" and "What are the barriers and facilitators to cost management?" Transcripts were transcribed verbatim and translated into English for analysis, with back-translation to ensure accuracy (13).

Data Analysis

Thematic analysis was conducted using MAXQDA software, following Braun and Clarke's framework (12). The process involved familiarization through repeated reading of transcripts, open coding to identify initial concepts (e.g., "process optimization") (13), axial coding to connect related codes (e.g., linking "electronic health records" to "cost reduction"), and selective coding to develop main themes (e.g., "financial transparency") (14). Two researchers independently coded the data, achieving an inter-coder reliability kappa coefficient of 0.87, indicating strong agreement (14). Disagreements between the two independent coders were resolved through iterative discussions and consensus-building sessions, with a third researcher consulted in cases of persistent divergence to maintain objectivity and achieve the reported inter-coder reliability kappa coefficient of 0.87. Credibility and confirmability were guaranteed through peer debriefing with two separate researchers and member checking with ten participants.

Trustworthiness and Ethical Considerations

A variety of strategies were used to guarantee reliability. By confirming the identities of ten participants and conducting triangulation among different stakeholder groups, credibility was established. By carefully recording the whole study procedure, including coding choices, consistency was preserved. The comprehensive explanations of the study's background and participants' varied backgrounds improved the transferability. Extensive descriptions of the study setting and participant diversity im-

proved the transferability. Confirmability was attained via researcher reflexivity and peer debriefing to mitigate bias (15). Approval for ethical considerations was granted by the Ethics Committee of Tehran University of Medical Sciences (IR.TUMS.SPH.REC.1398.041). All participants gave their informed consent, stressing the value of confidentiality, their ability to withdraw at any moment, and the fact that participation was voluntary. The research team was the only one having access to the anonymized and securely stored data.

Results

A thematic analysis of semi-structured interviews with 80 participants from public and private hospitals in Tehran (hospital managers, quality improvement managers, human resource managers, physicians, nurses, financial managers, accountants, revenue officers, and healthcare professionals), universities headquarters (vice-chancelleries for treatment, health, human resources, and development, as well as financial and budget management), the Ministry of Health, and the Social Security Organization revealed five key themes that encapsulate cost management strategies in Iranian hospitals: (1) Transparency and Information Technology; (2) Process and Resource Management; (3) Human Resources Management and Organizational Culture; (4) Systematic Approaches and Policy Development; (5) Addressing Structural and Economic Challenges. These themes comprise 11 strategic categories identified by respondents, demonstrating a comprehensive approach to cost management. Each subject is supported by main codes, vital codes, and relevant quotations, as outlined in Table 2.

Transparency and Information Technology

Participants emphasized that digital tools, like Hospital Information Systems (HIS; systems for managing hospital data), Health Information Management (HIM; systems for handling health data), and Squirrel software, are essential for improving financial transparency and minimizing errors. Real-time cost monitoring and automated tracking facilitated data-driven decision-making. A manager remarked, "Following the implementation of HIM, we re-

Table 2. Themes, Main Codes, and Pivotal Codes

Theme	Main Codes	Pivotal Codes
Transparency and Information Technology	Hospital Information Systems (HIS, HIM, Squirrel Software), managerial dashboards, transparent financial reporting, accurate data collection, automated cost recording	Real-time financial transparency, structured financial documentation, advanced HIS data analytics, ongoing cost surveillance, minimization of errors, and resource waste
Process and Resource Management	Inventory and consumable management, service and process standardization, process digitization, infrastructure optimization, centralized procurement, waste reduction, process automation, energy management, pharmaceutical management, capital management	Accurate consumption tracking, standardized service protocols, waste minimization in resources, enhanced operational efficiency, robust inventory controls, full process digitization, improved energy utilization, optimized pharmaceutical sourcing, effective capital asset oversight
Human Resource Management and Organizational Culture	Workforce optimization, staff training, motivation and incentives, staff awareness, responsibility and ownership, work measurement and performance evaluation, hospital management awareness	Strategic workforce alignment, boosted staff productivity, participatory decision-making, fostered an ownership mindset, comprehensive in-service training, reduction of non-essential personnel, heightened managerial cost consciousness
Systematic Approaches and Policy Development	Inter-unit and macro coordination, financial and administrative agreements, report-based oversight, managed competition, outcome-based payment systems, tariff alignment with inflation	Enhanced organizational synergy, integrated macro-local governance, rigorous systemic monitoring and evaluation, incentivized performance mechanisms, strategies for indirect cost mitigation
Addressing Structural and Economic Challenges	Specific protocols (foreign nationals, blood waste), addressing inflation and insurance delays, managing bureaucracy, engaging philanthropic resources	Adaptation to economic pressures, effective management of systemic constraints, strategic acquisition of external resources

duced otoscope expenses by 400 million IRR" [E64]. Another highlighted, "Squirrel software monitors all metrics, specifying who inputs which data." [E67]. The centralized Health Information System (HIS) diminished financial inconsistencies, as noted by a participant who remarked, "Centralized HIS significantly reduces errors." [E5]. These technologies lowered errors by as much as 30% in specific hospitals, consistent with global findings regarding technology-driven cost management (16, 17).

Process and Resource Management

This theme includes strategies that will improve operational procedures and resource allocation, such as standardization, digitization, centralized procurement, energy management, pharmaceutical management, and capital management. Participants indicated substantial savings via standardized protocols such as mini-surgical packs: "Mini-packs for surgeries decreased consumable expenses." [E70] Paperless solutions have been extensively implemented, with one manager remarking, "Since 2023, 99% of our processes are paperless, significantly reducing paper expenses." [E13] Centralized procurement increases negotiating leverage: "Centralized procurement by universities reduces expenses and mitigates corruption." [E14]. Energy-efficient equipment and optimized drug procurement further decreased costs, but supply chain disruptions presented issues, aligning with findings in other middle-income nations (18).

Human Resource Management and Organizational Culture

Considering that human resources constitute 60–70% of hospital expenditures, participants underlined the need for workforce efficiency, training, and cultivating a cost-aware culture. Work measurement guarantees enough staffing: "We evaluate the required number of personnel for each ward" [E42]. Training improved efficiency, as one manager noted, "Ward secretaries became proficient in financial tasks following training" [E35]. Waste was decreased by ownership culture and incentives. "When employees perceive the hospital as their own, they exhibit reduced wastefulness" [E1]. In line with WHO recommendations for workforce engagement in cost management, increasing managerial awareness of cost control was also crucial (4, 19).

Systematic Approaches and Policy Development

Systematic coordination among ministries, universities, and hospitals, strengthened by performance-based remuneration and regulated competition, enhanced cost efficiency. Participants emphasized the advantages of consolidated contracts: "A singular contract enhances negotiating leverage" [E49]. Managed competition was suggested for better service delivery: "Hospitals that provide services at minimal costs excel in managed competition" [E52]. It was essential to align tariffs with Iran's 40% inflation rate: "Tariffs must correspond to 40% inflation" [E60]. These methods conform to OECD frameworks for health system governance (2). Obstacles comprised bureaucratic opposition and insufficient inter-sectoral trust,

requiring stringent oversight actions.

Addressing Structural and Economic Challenges

Participants identified innovative solutions to address bureaucratic and economic barriers, such as protocols for foreign nationals, charity partnerships, and adaptive management. Protocols reduced non-reimbursable costs: "We developed protocols to manage foreign patient costs" [E66]. Philanthropic contributions mitigated financial burdens: "Philanthropists financed equipment enhancements" [E36]. Adaptive local administration alleviated bureaucratic hindrances: "Local solutions circumvent governmental obstacles" [E30]. These techniques address Iran's specific challenges, including delayed insurance payouts, and align with global findings on external funding mobilization (20).

Cross-Cutting Themes

Among the overarching themes were the necessity of a cost-conscious culture, data-driven decision-making, incorporating market-oriented strategies, and ongoing observation. Participants pointed out the importance of stakeholder engagement and systemic coordination, noting challenges such as resource limitations and resistance to change. The findings highlight the necessity for integrated, multi-level strategies to achieve sustainable cost management in Iranian hospitals.

Discussion

This qualitative study delineated five key themes that inform cost management strategies in Iranian hospitals: Transparency and Information Technology, Process and Resource Management, Human Resource Management and Organizational Culture, Systematic Approaches and Policy Development, and Addressing Structural and Economic Challenges. Themes encompass 11 strategic areas: human resource development, resource management, medication management, energy management, financial and insurance management, information technology, administrative assistance, clinical management, capital management, interdepartmental collaboration, and awareness of hospital management. The outcomes provide a comprehensive structure for addressing the escalating expenses of Iran's healthcare system, characterized by postponed insurance payouts, administrative inefficiencies, and economic inflation. The discussion situates these results within the framework of both international and Iranian scholarly work, evaluates their strengths and weaknesses, and explores the implications for policy and practice. [Figure 1](#) summarizes the thematic framework for cost management strategies.

Transparency and Information Technology

A key component of cost management plans in Iranian hospitals is the incorporation of information technology (IT) tools, such as electronic health records (EHRs), computerized physician order entry (CPOE) systems, hospital information systems (HIS), and managerial dashboards.

These technologies support global trends in healthcare

digitization by improving financial oversight, streamlining operations, and increasing transparency. Hospital Information Systems (HIS) and management dashboards exemplify digital systems that have shown considerable potential in Iranian healthcare institutions for enhancing operational efficiency and reducing expenses.

By standardizing procedures, enhancing workforce efficiency, minimizing unnecessary tests, and cutting down on supply waste, dashboards have the potential to save anywhere from US\$160,000 to US\$10.7 million annually, according to a 2024 systematic review (21). In alignment with observations from India (16), where the adoption of Health Information Systems (HIS) led to a 25% reduction in operational expenses [E43], participants in Iran noted a remarkable decrease of 400 million IRR in costs associated with otoscopes due to the implementation of HIS. These savings stem from real-time data integration, which enables decision-makers to identify and rectify financial inefficiencies swiftly.

Dashboards, for instance, improve workflow transparency, which may save up to 11,200 hours of staff time annually and increase patient and caregiver satisfaction (21).

Likewise, there was a reduction of up to 30% in errors at Iranian hospitals, attributable to real-time surveillance through HIS (2). According to these results, information technology solutions can promote transparency and accountability, two qualities that are essential for efficient cost control.

These advantages are further enhanced by business intelligence (BI) tools, which make data-driven process optimization possible. Case studies from top institutions demonstrate how BI tools facilitate the rapid identification of inefficiencies, such as wasteful resource allocation, improving both financial performance and care quality (22). In middle-income countries like Iran, these tools support successful cost-management strategies that have been observed elsewhere, such as workforce optimization in Brazilian hospitals (10). Problems like high upfront costs, cybersecurity vulnerabilities, and the need for workforce upskilling continue to hinder adoption (22). These challenges are particularly apparent in resource-constrained environments, like Iran, where a lack of technical expertise and inadequate IT infrastructure obstruct progress (4).

EHRs and CPOE systems further enhance cost transparency and accountability. EHRs consolidate patient data, reducing redundant tests by displaying real-time cost information to physicians, which promotes cost-conscious decision-making (23). In Iranian hospitals, however, high implementation costs, technical challenges, and resistance to change limit EHR adoption (24, 25).

Similarly, by increasing prescribing accuracy and lowering adverse drug events, CPOE systems optimize resource utilization and minimize medication errors through integrated clinical decision support, which results in significant cost savings (26, 27). However, user satisfaction and system design are crucial to their success because poorly designed systems can result in inefficiencies (28).

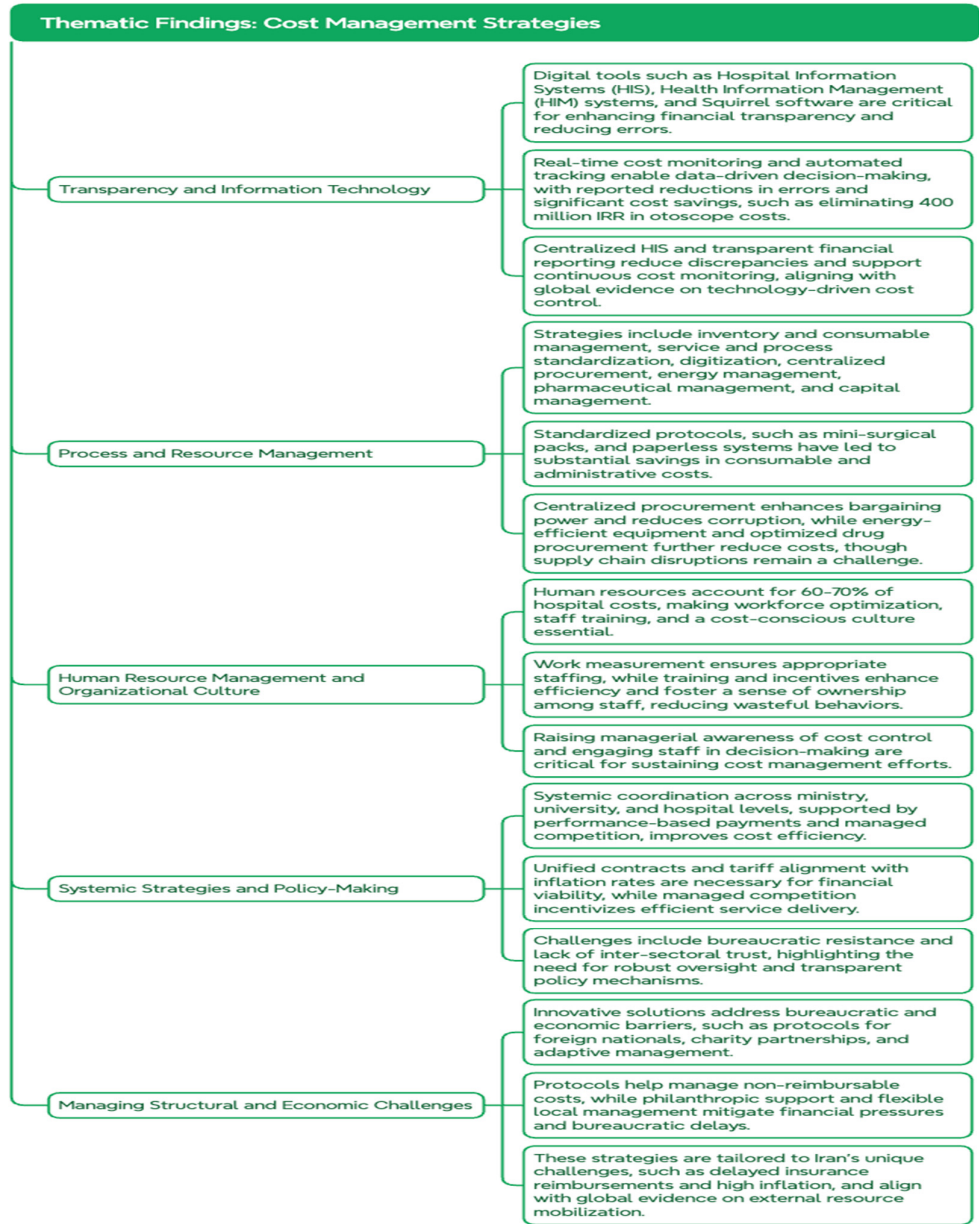


Figure 1. Thematic Framework for Cost Management Strategies

To address these issues, strong infrastructure, comprehensive employee training, and tailored system customization are required (24, 29). Prioritized recommendations include investing in scalable HIS and managerial dashboards for real-time monitoring, with strategies to overcome barriers such as phased implementation to manage upfront costs, comprehensive staff training programs to address resistance and skill gaps, and partnerships with cybersecurity experts to mitigate vulnerabilities. The maintenance of these benefits requires policymakers to invest in cybersecurity infrastructure to mitigate vulnerabilities, prioritize scalable, modular IT solutions that accommodate resource constraints, and ensure ongoing technical training for clinical and administrative staff (21).

These actions are necessary for the digital transformation of Iranian hospitals to be robust and successful.

Process and Resource Management

In Iranian hospitals, resolving operational inefficiencies and attaining long-term cost control depend heavily on efficient process and resource management techniques. Standardized procedures, digital workflows, centralized procurement, lean management, clinical pathways, and supply chain optimization can all be used to boost hospital efficiency without sacrificing the quality of care. Standardized procedures and digital workflows are increasingly important parts of cost-cutting initiatives. According to a review, standardizing clinical pathways reduced variabil-

ity and needless interventions, which directly reduced costs (30). Mini-surgical packs and paperless systems have also reduced consumables and administrative costs in Iranian hospitals, which is consistent with Turkish research that found standardized procurement reduced costs without sacrificing the quality of care (31). These tactics promote a cycle of continuous improvement by increasing staff productivity, lowering documentation burdens, and enhancing cost predictability (30). However, as seen in Iran, supply chain disruptions and exorbitant drug prices are signs of global issues that require close observation to guarantee precise results (32).

By reducing the corruption risks and inefficiencies connected to a multi-payer system, centralized procurement provides notable cost control benefits (33). A 2023 Chinese study on coronary stents found that centralized purchasing reduced medical expenses and prevented the overuse of costly devices without compromising the quality of care (34). Iran has seen greater savings thanks to similar tactics, energy-efficient equipment, and improved drug procurement. However, potential risks such as supply shortages and an increase in readmissions underscore the need for stringent supplier management and oversight (34). Just-in-time (JIT) inventory systems can help further reduce excess stock and supply chain disruptions, which is a global recommendation for cost containment through evidence-based resource allocation (35).

Lean management practices and clinical pathways significantly boost operational productivity. Lean methodologies, including value stream mapping and the 5S system (Sort, Set in order, Shine, Standardize, Sustain), have led to decreased patient wait times, optimized workflows, and improved resource efficiency in healthcare environments (36, 37). For example, healthcare facilities have reported lower operating expenses and enhanced employee satisfaction due to the implementation of lean strategies (38). By standardizing treatment protocols, clinical pathways reduce unnecessary procedures and optimize resource utilization, thereby enhancing patient satisfaction (39, 40). These techniques align with global studies that emphasize process standardization as a crucial element of cost containment.

Enhancing supply chain processes seeks to tackle challenges related to stock management and supplier reliability, particularly within the healthcare sector. Approaches such as machine learning-driven demand prediction and advanced inventory management systems have lowered costs by as much as 18% while boosting delivery efficiency by 22% (41, 42). These advancements could significantly improve resource distribution in Iran, where supply chain challenges remain prevalent. By refining purchasing methods and promoting knowledge exchange, collaborative approaches—like partnerships between hospitals and educational institutions—can further bolster resilience (43).

However, leadership commitment, continuous process evaluation, and staff engagement are crucial for adapting these strategies to local conditions (44, 45).

Human Resource Management and Organizational Culture

Human resource management (HRM) and organizational culture are crucial for addressing the high labor costs, which account for between 50 and 80 percent of hospital budgets in Iran, and for advancing long-term cost management strategies. By combining advanced training, a cost-conscious organizational culture, and workforce optimization, Iranian hospitals can increase operational efficiency without sacrificing care quality.

Given that human resources account for 60–70% of hospital costs in international healthcare systems, workforce optimization is a crucial component of cost control. Work measurement, strategic staffing, and AI-powered scheduling and performance monitoring tools are effective. For example, an article in 2024 noted that optimal team sizing and lean schedules in Romanian hospitals decreased staff turnover, achieving cost-effectiveness through increased productivity and lower recruitment expenses (46).

By predicting patient volume trends and staffing needs, artificial intelligence-driven predictive analytics can avert staffing shortages and aid in flexible staffing models (47).

Additionally, cloud-based systems facilitate communication and accessibility, which reduces administrative burden and streamlines workforce management (48). By advocating for data-driven staffing to attain optimal resource allocation, these solutions satisfy WHO recommendations for workforce engagement.

Training and professional development are necessary to promote cost-conscious behaviors. Research from King Salman Medical City demonstrated that specific financial task training significantly increased efficiency by making non-financial staff members, such as ward secretaries, cost-conscious contributors (49). According to international data, systematic training programs can lower hospital department costs by 25–50% (50). This is consistent with Iranian financial task training. For example, Plan-Do-Study-Act approaches used in multifaceted pharmaceutical intervention programs were able to reduce drug costs by 20.82% (50). However, Saudi Arabia's issues, where incentives helped reduce overtime expenses, are similar to Iran's low wages and high employee turnover (49, 51) make training more challenging. Targeted retention policies and continual professional development are necessary to maintain these initiatives without compromising employee morale.

Organizational culture has a significant influence on cost management since it influences employee engagement and decision-making. A study found that organizational commitment and culture significantly reduce voluntary attrition rates, which in turn reduces the cost of recruiting and onboarding new staff (52). According to the job demands-resources theory, fostering an ownership culture in Iranian hospitals where employees take pride in the organization's achievements lowers wasteful behavior (53). Clan-oriented cultures that value cooperation and inclusivity have improved clinical judgment and worker satisfaction in Iran (54).

However, hierarchical cultures can impede adaptability,

necessitating cultural shifts to promote collaboration (55). Leadership commitment and workplace communication are signs of a cost-conscious culture that facilitates long-term cost reductions while enhancing the quality of care (56).

Technology integration, such as telemedicine and AI-driven workforce planning, further supports cost-effective HRM. Innovative technologies improve care access and reduce infrastructure costs, which is consistent with global trends in cost-effective service delivery (57). Iran can overcome operational challenges by implementing these technologies, but there are barriers such as cultural resistance and a lack of funding for training (44, 45). Staff involvement and continuous process auditing are crucial to overcoming these challenges and ensuring successful implementation.

Systematic Approaches and Policy Development

Addressing the dispersed healthcare financing and operational inefficiencies in Iranian hospitals requires systemic approaches and strong policymaking. Through promoting cooperation among universities, hospitals, and the Ministry of Health and Medical Education (MOHME) and through introducing managed competition, performance-based payment methods, and health information systems, Iran can enhance cost effectiveness without compromising the quality of care.

There should be systematic coordination at the hospital, university, and ministry levels to map Iran's healthcare system onto cost management objectives. To increase financial protection and reduce out-of-pocket expenses, the Health Transformation Plan (HTP), introduced in 2014, led to an increase in hospital admissions, but also resulted in higher overall costs (58, 59).

By enhancing financial viability through unified contracts and tariff alignment with Iran's 40% inflation rate, value-based healthcare models can be consistent with this (5, 60). Recent research on care coordination has demonstrated that by avoiding duplication of services and improving continuity of care, standardized processes and patient needs assessments have the potential to lower costs by 25-50% (50). By promoting stakeholder collaboration through transparent governance frameworks, as recommended by WHO (4), bureaucratic resistance and inter-sectoral mistrust can be decreased in Iran, ensuring long-term implementation (61).

Diagnosis-Related Groups (DRGs) and other performance-based payment models make healthcare more efficient by reducing unnecessary services. As the Primary Care First model illustrates, value-based care is encouraged through the linkage of financial incentives to cost and utilization measures, including acute hospital use and overall per capita cost. The introduction of DRGs demands intensive cost accounting systems and personnel training to be successful (62). Managed competition, inspired by Malaysia's outcome-based financing, further enhances cost control by steering providers toward efficiency (63). Although institutional capacity is still crucial, evidence from the social health insurance systems in the Netherlands, Germany, Switzerland, and Israel demon-

strates that controlled competition, backed by strict regulatory oversight, can achieve cost containment at the national level (64). Because of bureaucratic resistance and fragmented governance, Iran requires strong regulatory frameworks to ensure effective implementation (65, 66).

Data-driven decision-making and health information systems are essential for cost optimization. Implementations of health information exchange (HIE) have demonstrated favorable financial outcomes in 60% of cases. In cases, hospitals can utilize data analytics to reduce waste and allocate resources (50). Combining artificial intelligence and big data analytics can enhance evidence-based decision-making, solve inefficient resource use, and facilitate intelligent healthcare delivery systems (67). Nevertheless, issues such as variable policy implementation and poor infrastructure constrain uptake (68). That insurance reforms such as uniform tariffs and increased coverage have raised equity but at high administrative expense highlights the necessity for streamlined governance (65, 66).

To reap the most from these strategies, politicians need to invest in health information systems, open policy-making, and stakeholder collaboration. These actions align with the suggestions of WHO for strengthening health systems and can reduce trade-offs with the quality of care (4). Robust training programs prepare staff for payment innovations like DRGs, and hospital-university collaborations can strengthen knowledge transfer and allow for data-informed cost management.

Addressing Structural and Economic Challenges

Iranian hospitals face numerous challenges with their facilities and finances. For example, inflation is high, there are international sanctions, infrastructure is limited, and there are gaps in public funding. All of these factors make it harder for them to offer affordable healthcare. New ideas, such as rules for non-reimbursable costs, public-private partnerships (PPPs), donations, and adaptive management, can help alleviate some of these stresses.

Inflation and international sanctions are two economic problems that make it very hard to get medical supplies and equipment in Iran. Because of the sanctions, financial transactions have been limited, which has led to shortages of important medicines and higher prices for imported goods. People with chronic illnesses have been affected more by this (69-71). To address these challenges, Iranian hospitals have implemented rules for managing unreimbursable costs, such as providing specialized care for foreign patients, and have utilized donations to purchase new equipment. These methods are similar to India's successful public-private partnerships, which have improved healthcare access and infrastructure through collaborative funding models (72). Recent research highlights the increasing significance of philanthropy, with global funding reaching \$30 billion annually, competing with substantial federal contributions and facilitating capital investments essential for cost efficiency (73). In Iran, formalized charity partnerships can help fill funding gaps, but relying on outside sources can lead to inconsistencies, so strong governance is needed to ensure their sustainability.

Inefficiencies in the bureaucracy and centralized man-

agement exacerbate structural problems. Old facilities, not enough emergency services, and long waits for tests like thrombolysis for stroke patients make treatment less effective (74, 75). Centralized management frequently results in ineffective resource allocation, compromising operational efficiency (76). Flexible local management strategies, consistent with global evidence on decentralized decision-making, can alleviate bureaucratic delays by enabling hospital leaders to meet local (77). Recent studies show that using intermediary organizations to make regulatory processes more efficient improves communication and cuts down on administrative work, which saves a significant amount of money (78). In Iran, using adaptive management, like making custom protocols for different groups of patients, helps the economy stay strong while still following the rules.

To address infrastructure issues and funding gaps, we require targeted investments and innovative financing solutions. Strategic partnerships with philanthropic organizations and public-private partnerships (PPPs) can facilitate infrastructure improvements, such as the modernization of diagnostic equipment, thereby enhancing long-term cost efficiency (79, 80). Studies show that adaptive management strategies, such as new ways of financing, help hospitals deal with economic problems in an innovative way (50). Nonetheless, potential vulnerabilities, including data breaches resulting from excessive reliance on technology, highlight the necessity for robust IT security frameworks. It is crucial to make the health system more resilient by diversifying funding and improving resource management. This is especially true for vulnerable groups who have less access to care because of sanctions and inflation (69, 71).

Policy suggestions include making partnerships official with clear ways to hold people accountable, spending money on IT security to protect against weaknesses, and making infrastructure upgrades a top priority to fix old buildings. Collaborative governance among MOHME, universities, and hospitals can improve the distribution of resources and the enforcement of policies, which is in line with WHO's guidelines for strengthening health systems (4). These steps ensure that cost-cutting measures do not compromise the quality of care, particularly for groups that currently receive insufficient care.

The results of this study show that cost management efforts in Iranian hospitals are linked, which means that a unified approach is needed. Some of the most important cross-cutting themes are creating a culture of cost-consciousness, enabling data-driven decision-making, leveraging market-oriented approaches such as medical tourism, and ensuring continuous monitoring of processes. These themes fit with global health system frameworks and give helpful tips on how to find a balance between high-quality care and low-cost care in places where resources are limited. To manage costs effectively, a culture that prioritizes cost efficiency is needed. Encouraging employees to adopt cost-saving practices, such as reducing wasteful behaviors and fostering ownership cultures, helps operations run more smoothly. These findings align with the World Health Organization's (WHO) emphasis

on the importance of engaging the workforce for the long-term health of the system. In Iran, where 80% of the population uses public hospitals, it takes ongoing training in financial management and a commitment from leaders to get staff to work toward the goals of the organization. For instance, adding cost-awareness training to workforce development programs can turn clinical and administrative staff into proactive contributors to cost control. This approach has been shown to work in other countries where cultural changes led to lower operational costs without lowering the quality of care (81). Electronic health records (EHRs) and computerized physician order entry (CPOE) systems are examples of integrated IT systems that are very important for making costs more visible and helping to allocate resources based on evidence. These systems have demonstrated the ability to reduce errors by up to 30% and optimize the use of resources. These findings align with global studies indicating that health information exchange installations enjoyed a 60% favorable impact on finances. However, challenges such as excessive implementation expenses and cybersecurity vulnerabilities necessitate the presence of robust IT security structures and adaptable solutions functional in resource-constrained settings. Iranian hospitals can enhance decision-making and process flows, and keep pace with international trends in digital transformation for cost control by emphasizing integrated IT systems (82, 83). The integration of market-oriented strategies, especially within the realm of medical tourism, has become increasingly significant among interdisciplinary procedures. Torkzadeh et al. (2024) put forward a value-based segmentation framework to help hospitals in the West Asian region align their services with the needs of different groups of patients. This strategy enables Iran to compete more effectively in the regional health market while also reducing costs by enhancing service efficiency, optimizing resource utilization, and increasing revenue. The segmentation identified five distinct types of medical tourists, including those seeking healthcare and those seeking infrastructure. People in the "perfectionism" group were most interested in high-quality services. Iranian hospitals can attract more medical tourists by using targeted strategies on these groups. This strategy provides them with additional income streams and aids in paying their bills (84). Ongoing evaluations of processes, such as lean management and clinical pathways, ensure the sustainability of cost-saving measures. In Iran, ongoing monitoring can help address problems with managing the supply chain and delays in government work that are exacerbated by inflation and sanctions (85). Value stream mapping and other lean management tools have reduced patient wait times and lowered the costs of running the business. Clinical pathways have also reduced unnecessary treatments, which has made patients happier. When these process improvements are carefully monitored, they ensure that the results are always the same, which is in line with global standards for evidence-based care delivery (81). That these strategies are interconnected demonstrates the need for a concerted approach to cost management. Open and user-friendly IT platforms facilitate easier improvement of processes such

as lean management and supply chain optimization. Conversely, streamlining staff and developing a positive company culture significantly enhances systemic improvements. Finally, employing market-driven strategies such as medical tourism can render the business more financially viable by optimizing its utilization of resources and attracting more revenue. Iranian hospitals can conserve costs and provide the same quality care to all by synergizing these grand ideas.

Policy implications include investing in hospital information systems (HIS) to enhance financial clarity and reduce errors, centralized procurement systems to reduce supply costs and diminish the likelihood of corruption, tariff adjustments to align hospital charges with inflation rates for financial sustainability, and inter-organizational coordination through partnerships between universities and hospitals with centralized dashboards to facilitate resource sharing. Practice implications involve human resource optimization by implementing work measurement and staff training programs to enhance efficiency (as human resources account for a significant portion of hospital costs), regular training for managers on digital tools to strengthen the organization, and partnerships with charities and legal groups to provide resources and alleviate financial concerns during patient transitions.

This study provides substantial qualitative insights but is constrained by several limitations: Limited Generalizability: The focus on urban public hospitals in Tehran, Isfahan, and Tabriz may not accurately reflect conditions in rural or private hospitals. Participants' Bias: Self-selection and reluctance to reveal sensitive financial data may result in bias. Absence of Quantitative Validation: The qualitative framework does not incorporate quantitative validation of the financial and clinical ramifications of the proposed strategies. Sustainability Concerns: The study does not evaluate the long-term sustainability of the identified strategies or their robustness against risks such as data breaches.

To address these limitations, future research could employ mixed-methods approaches to substantiate the financial and clinical ramifications of the strategies, conduct longitudinal studies to assess the durability of IT-driven interventions and systemic reforms over time, and perform comparative analyses with other middle-income countries to discern transferable practices. This integrated framework and its associated strategies provide a comprehensive approach to enhancing cost-effectiveness in healthcare systems with constrained resources, exemplified by Iran's.

Conclusion

This qualitative study offers an extensive framework for cost management in Iranian hospitals, organized around five interrelated themes: Transparency and Information Technology, Process and Resource Management, Human Resource Management and Organizational Culture, Systemic Strategies and Policy-development, and Managing Structural and Economic Challenges. These themes cover 11 strategic areas, such as developing human resources, managing consumables and drugs, overseeing energy and

finances, and coordinating between units. All of them deal with Iran's unique healthcare issues, such as high inflation, a slow bureaucracy, and late payments from insurance companies. They also provide helpful information that can be used in healthcare systems around the world that have very limited financial resources.

In response to the first research question on techniques adopted to reduce costs effectively, the findings highlight a range of stakeholder-driven approaches, including digital tools for transparency (e.g., HIS reducing errors by 30%), process standardization (e.g., mini-surgical packs lowering consumables), workforce training (e.g., financial task proficiency cutting inefficiencies), systematic coordination (e.g., consolidated contracts enhancing negotiation), and adaptive solutions (e.g., charity partnerships mitigating burdens). These form an integrated framework addressing the main challenge of escalating costs through multi-level, quality-preserving measures.

For the second question on how these strategies tackle Iran's economic and structural issues, the themes directly confront challenges like inflation and delayed reimbursements via tariff alignment and centralized procurement to curb waste, while bureaucratic inefficiencies are mitigated through local adaptive management and inter-sectoral collaboration, drawing parallels with global middle-income contexts.

Regarding the third question on facilitators and impediments, cross-cutting elements reveal facilitators such as stakeholder engagement, data-driven decisions, and market-oriented strategies (e.g., medical tourism for revenue), while impediments include resource limitations, resistance to change, and cybersecurity risks, with recommendations for training and oversight to enable implementation.

The findings emphasize the critical role of digital tools like Hospital Information Systems (HIS) in enhancing transparency and reducing errors, as evidenced by global best practices. Standardized protocols and centralized procurement for process optimization reduce the risks of waste and corruption.

This is consistent with what has succeeded in other middle-income nations. Hospitals must have sound human resource policies, such as assessing staff and encouraging cost-consciousness, to maximize their extensive labor expenditures, which comprise a significant portion of their budgets. Following WHO's health system strengthening frameworks, coordinated systematic efforts and innovative solutions to fiscal issues, such as collaboration with charities, ensure the economy remains robust. This master plan illustrates how to reconcile cost-effectiveness with quality of care, which will enable Iran and other locations to achieve their universal health coverage objectives.

The evidence is used to develop a set of recommendations for improving cost control in Iranian hospitals that include operational, policy, and educational aspects. One of the main objectives of this policy is to concentrate on significant investments in digital infrastructure. Increasing productivity, especially in environments with limited resources, requires real-time cost monitoring and improvements in financial transparency, which can be achieved through the use of hospital information systems (HIS) and

managerial dashboards. Centralized purchasing has proven successful in optimizing procurement methods in several middle-income countries. This strategy can reduce supplier costs and the possibility of corruption. Payment rates must be modified to take into account the nation's economic conditions, particularly its high rate of inflation, in order to preserve hospitals' financial stability. Improving operational labor management has cultural and economic benefits. Work measurement systems and ongoing training initiatives can boost worker productivity and foster a waste-reduction, cost-conscious corporate culture. Formal agreements with nonprofit and legal organizations could improve hospital resources and speed up processes like patient discharge. Additionally, paperless systems and standardized mini-surgical packs are examples of process innovations that lower operating costs without sacrificing the quality of care. Ultimately, hospital administrators require targeted education-related training programs. To guarantee that executives acquire the necessary technical know-how and strategic insights needed to promote long-lasting change, these initiatives should place a high priority on digital solutions, integrated systems, and the principles of cost management. In order to achieve financially stable and high-quality healthcare delivery, these recommendations collectively represent a global call for multifaceted cost management strategies that integrate organizational, systemic, and technical innovations.

Authors' Contributions

STR and MA contributed to conceptualization, methodology, investigation, and writing the original draft. STR also contributed to data curation and formal analysis. AMMR and IH contributed to supervision, validation, and reviewing and editing the manuscript. All authors have read and approved the final manuscript.

Ethical Considerations

Approval for ethical considerations was granted by the Ethics Committee of Tehran University of Medical Sciences (IR.TUMS.SPH.REC.1398.041). All participants gave their informed consent, stressing the value of confidentiality, their ability to withdraw at any moment, and the fact that participation was voluntary. The research team was the only one having access to the anonymized and securely stored data. The study adhered to the principles of the Declaration of Helsinki, ensuring respect for human subjects, beneficence, non-maleficence, and justice. No vulnerable populations were involved, and all data were de-identified to protect privacy.

Acknowledgment

We thank the participants for their time and the Tehran University of Medical Sciences for providing ethical approval.

Conflict of Interests

The authors declare that they have no competing interests.

References

1. Dubas-Jakóbczyk K, Kocot E, Tambor M, Szetela P, Kostrzevska O, Siegrist Jr RB, et al. The Association Between Hospital Financial Performance and the Quality of Care – A Scoping Literature Review. *Int. J. Health Policy Manag.* 2022;11(12):2816-2828
2. Organisation for Economic Co-operation and Development. Tackling wasteful spending on health. OECD; 2017.
3. Khadivi Y, Baktashian M, Khadivi R. Hospitalization and cost trends during Iranian health system reforms over two decades: a time series analysis. *Int J Equity Health.* 2025;24(1).
4. Etienne C, Asamoah-Baah A, Evans DB. Health systems financing: the path to universal coverage. World Health Organization; 2010.
5. Jahanmehr N, Noferesti M, Damiri S, Abdi Z, Goudarzi R. The Projection of Iran's Healthcare Expenditures By 2030: Evidence of a Time-Series Analysis. *Int J Health Policy Manag.* 2022;11(11):2563-2573.
6. Ravaghi H, Safarani S, Raeissi P, Maleki M. Financial challenges of teaching hospitals and providing solutions. *J. Educ. Health Promot.* 2018;7:1.
7. Meskarpour-Amiri M, Shokri N, Aliyari S, Bahadori M, Hosseini-Shokouh S-M. Strategies to reduce costs and increase revenue in hospitals: a mixed methods investigation in Iran. *BMC Health Serv Res.* 2025;25(1).
8. Horsley T, Hyde C, Santesso N, Parkes J, Milne R, Stewart R. Teaching critical appraisal skills in healthcare settings. *Cochrane Database of Systematic Reviews.* 2011(11).
9. Chauhan AS, Guinness L, Bahuguna P, Singh MP, Aggarwal V, Rajsekhar K, et al. Cost of hospital services in India: a multi-site study to inform provider payment rates and Health Technology Assessment. *BMC Health Serv Res.* 2022;22(1):1343.
10. Paim J, Travassos C, Almeida C, Bahia L, Macinko J. The Brazilian health system: history, advances, and challenges. *Lancet* 2011;377(9779):1778-1797.
11. Doshmangir L, Bazayr M, Najafi B, Haghparast-Bidgoli H. Health Financing Consequences of Implementing Health Transformation Plan in Iran: Achievements and Challenges. *International Journal of Health Policy and Management.* 2019;8(6):384-6.
12. Braun V, Clarke V. Using thematic analysis in psychology. *Qual. Res. Psychol.* 2006;3(2):77-101.
13. Brislin RW. Back-translation for cross-cultural research. *Journal of cross-cultural psychology.* 1970 Sep;1(3):185-216.
14. McHugh ML. Interrater reliability: the kappa statistic. *Biochemia medica.* 2012 Oct 15;22(3):276-82.
15. Lincoln YS. Naturalistic inquiry. sage; 1985.
16. Pai MMM, Ganiga R, Pai RM, Sinha RK. Standard electronic health record (EHR) framework for Indian healthcare system. *Health Serv. Outcomes Res. Methodol.* 2021;21(3):339-62.
17. Kasaei M, Rezaei P, Tavakoli N, Ehteshami A. The role of health information technology in reducing preventable medical errors and improving patient safety. *International Journal of Health System and Disaster Management.* 2013;1(4).
18. Chandra H, Rinkoo AV, Verma JK, Verma S, Kapoor R, Sharma RK. Supply chain management with cost-containment & financial-sustainability in a tertiary care hospital. *Journal of health and human services administration.* 2013 Mar;36(1):3-23.
19. Khan S, Saadi IA. Maximizing Cost Efficiency & Enhancing the Culture of Cost Consciousness Through Workforce Engagement. In Abu Dhabi International Petroleum Exhibition and Conference 2017 Nov 13 (p. D021S047R005). SPE.
20. Zeng W, Yao Y, Barroy H, Cylus J, Li G. Improving fiscal space for health from the perspective of efficiency in low- and middle-income countries: What is the evidence? *J Glob Health.* 2020;10(2):020421.
21. Coiera E, Chan A, Brooke-Cowden K, Rahimi-Ardabili H, Halim N, Tufanaru C. Clinical and economic impact of digital dashboards on hospital inpatient care: a systematic review. *JAMIA open.* 2025 Aug;8(4):o0af078.
22. Nelly Tochi N. Reducing operational costs in healthcare through advanced BI tools and data integration. *World Journal of Advanced Research and Reviews.* 2024;22(3):1144-56.
23. Horn DM, Koplan KE, Senese MD, Orav EJ, Sequist TD. The Impact of Cost Displays on Primary Care Physician Laboratory Test Ordering. *J. Gen. Intern. Med.* 2013;29(5):708-14.
24. Ayat M. E-Health Implementation Challenges and HIS Evaluation in Accordance with EMRAM in Iran. *Health Technology Assessment in Action.* 2024.

25. Abbasi H, Rahimi B, Jebraeily M, Nourani A. End-users' perspectives on factors affecting implementation and utilization of the Iranian electronic health record system: a qualitative study in a developing country. *BMC Health Services Research*. 2023;23(1).
26. Bates DW, Teich JM, Lee J, Seger D, Kuperman GJ, Ma'Lu'f N, Boyle D, Leape L. The impact of computerized physician order entry on medication error prevention. *J Am Med Inform Assoc*. 1999 Jul 1;6(4):313-21.
27. Kaushal R, Jha AK, Franz C, Glaser J, Shetty KD, Jaggi T, et al. Return on Investment for a Computerized Physician Order Entry System. *Journal of the American Medical Informatics Association*. 2006;13(3):261-6.
28. Niknam F, Khammarnia M, Zand F, Fallahnejad E, Sharifian R. Evaluating physicians and nurses' satisfaction with computerized physician order entry system in Iran. *Health Management & Information Science*. 2018 Apr 8;5(2):51-6.
29. Khammarnia M, Setoodehzadeh F, Peyvand M, Setayesh AH, Rezaei K, KordTamini A, et al. Evaluation of Integrated Health System Technology Acceptance among the users of Health Centers of Zahedan University of Medical Sciences: Iran. *Evidence Based Health Policy, Management and Economics*. 2019.
30. Alahmar A, Alkhatib O. Computerization of Clinical Pathways: A Literature Review and Directions for Future Research. *arXiv preprint arXiv:2203.00815*. 2022 Mar 2.
31. Yurtkuran A, Özdemir D, Yurtkuran DM, Emel E. Lean transformation to reduce costs in healthcare: A public hospital case in Turkey. *Journal of Hospital Administration*. 2017;6(4).
32. Elmuti D, Khoury G, Omran O, Abou-Zaid AS. Challenges and opportunities of health care supply chain management in the United States. *Health Mark Q*. 2013;30(2):128-43.
33. Teymourifar, Aydin. "Structural Inefficiencies in the US Healthcare System." Available at SSRN 5230160 (2025).
34. Jian W, Zhou W, Zhang L. The impact of centralized coronary stent procurement program on acute myocardial infarction treatments: evidence from China. *Front Public Health*. 2023;11:1285558.
35. Moreira A, Crispim J. The importance of the health information systems in value-based healthcare initiatives: A scoping review. *Procedia Computer Science*. 2024 Jan 1;239:1476-82.
36. Третьяк В. Implementing Lean Management Principles to Optimize Healthcare Facility Operations. *Економіка та суспільство*. 2024(62).
37. Nelson-Peterson DL, Leppa CJ. Creating an environment for caring using lean principles of the Virginia Mason Production System. *JONA: The Journal of Nursing Administration*. 2007 Jun 1;37(6):287-94.
38. Naidoo L. The effect of Lean on staff morale in a rural district hospital outpatient department in KwaZulu-Natal. *Journal of Contemporary Management*. 2015 Jan 1;12(1):571-89.
39. Eitel DR, Rudkin SE, Malvey MA, Killeen JP, Pines JM. Improving Service Quality by Understanding Emergency Department Flow: A White Paper and Position Statement Prepared For the American Academy of Emergency Medicine. *The Journal of Emergency Medicine*. 2010;38(1):70-9.
40. Borgert M, Binnekade J, Paulus F, Goossens A, Dongelmans D. A flowchart for building evidence-based care bundles in intensive care: based on a systematic review. *International Journal for Quality in Health Care*. 2017;29(2):163-75.
41. Rishi JP, Waghodekar P, Manimegalai V, Kumar Singh A, Ramesh A, Sathish Jackson PV. Data-Driven Approaches to Improve Healthcare Supply Chain Management. *Journal of Neonatal Surgery*. 2025;14(8s):814-825.
42. Quadras G, Talyshinskii A, Kowshik S. Innovative Strategies in Lean Supply Chain Management: Enhancing Efficiency in Healthcare. *Journal of Computers, Mechanical and Management*. 2024;3(3):22-35.
43. Achor EC, Okon II, Jader A, Ewelike SC, Ibrahim M, Lucero-Priso DE. Achieving sustainable healthcare cost containment in the United States: the role of collaborative efforts among stakeholders. *Discover Health Systems*. 2025;4(1).
44. Jankelova N, Belovicova M, Moricova S, Mucska M. Application of lean Management Principles in Hospitals in Slovakia. *Clinical Social Work and Health Intervention*. 2024;15(1):21-8.
45. Centauri F, Mazzocato P, Villa S, Marsilio M. System-wide lean implementation in health care: a multiple case study. *Health Services Management Research*. 2018 May;31(2):60-73.
46. cumpăt MC. Human resources management in public hospitals in Romania. *Cross-Cultural Management Journal*. 2024 Jul 1;26(2).
47. Chanthathi SR. Project Workforce Management Using Cloud & and Cost Optimization with Artificial Intelligence. *Engineering and Technology Journal*. 2025;10(04).
48. Crist-Grundman D, Mulrooney G. Effective workforce management starts with leveraging technology, while staffing optimization requires true collaboration. *Nursing Economic\$*. 2011 Jul 1;29(4).
49. Al-Zahrani RES, Al-Harbi SS. impact of incentives on employee performance and job satisfaction at Madinah General Hospital. *International journal of health sciences*. 2023;7(S1):1489-507.
50. Almhewari SA, Almalki IS, Abumilha BA, Altharwi BH. Improving Hospital Efficiency and Cost Management: A Systematic Review and Meta-Analysis. *Cureus*. 2024.
51. Rahimi B, Seproo FG, Khalilnezhad R, Khodadost M, Kashkalani T, Younesi F, et al. Factors associated with the non-retention of health sector employees recruited in Iran: a survival analysis. *BMC Health Services Research*. 2024;24(1).
52. Rahmani H, Azari S, Vasokolaee Gr, Mirghaed MT, Raadabadi M. Organizational Culture and the Organizational Commitment; Correlational Study in Hospital Staffs. *Asian Social Science*. 2015;11(5).
53. Demerouti E, Bakker AB, Nachreiner F, Schaufeli WB. The job demands-resources model of burnout. *Journal of Applied psychology*. 2001 Jun;86(3):499.
54. Salehi T, Shojae N, Haghani H. Relationship Between Participation in Clinical Decision-making and Organizational Culture Among Nurses in Intensive Care Units of Hospitals Affiliated to Iran University of Medical Sciences. *Iran Journal of Nursing*. 2022;35(138):360-73.
55. El Desoky E, El Said N, El-Shaar A. Organizational culture, individual innovation and their relation to nursing staff's work engagement. *Mansoura Nursing Journal*. 2021 Feb 1;8(3):39-59.
56. Hulkova V, Kilikova M, Sabo S. Organizational Culture of Health Care Facility as a Predictor of the job Satisfaction of Nurses. *Clinical Social Work and Health Intervention*. 2024;15(2):32-6.
57. Oluwaseyi Rita O, Funmilola Olatundun O, Oluwafunmi Adijat E, Beatrice O. Reviewing healthcare financial management: Strategies for cost-effective care. *World Journal of Advanced Research and Reviews*. 2024;21(2):958-66.
58. Zahed Pasha Y, Mouodi S, Ahmadvpour Kacho M, Hajitabar Z, Jahangir T, Bijani A. Comparing the hospital costs of the neonates admitted to NICU of Amirkola Children's Hospital Before and After the Implementation of the Health Sector Reform in Iran. *Iranian Journal of Neonatology*. 2017 Sep 1;8(3):25-30.
59. Doshmangir L, Najafi B, Mostafavi H, Moshiri E. <p>Future Development Through the Past: Pathology of the Financing Dimension of Iran's Health Transformation Plan</p>. *ClinicoEconomics and Outcomes Research*. 2020;Volume 12:345-54.
60. Khalil H, Ameen M, Davies C, Liu C. Implementing value-based healthcare: a scoping review of key elements, outcomes, and challenges for sustainable healthcare systems. *Frontiers in Public Health*. 2025;13.
61. Doshmangir L, Rashidian A, Jafari M, Ravaghi H, Takian A. Fail to prepare and you can prepare to fail: the experience of financing path changes in teaching hospitals in Iran. *BMC Health Services Research*. 2016;16(1).
62. Lin AL, Hou JH. Diagnosis-Related Groups payment reform and hospital cost control. *Technology and Health Care*. 2025;33(1):17-24.
63. Nambiar A. Managed competition: Revisiting enthoven's principles. *WP-2021-07*; 2021 Nov.
64. Fernando R, Leticia AB, Antonio JT. How does managed competition affect hospital prices in a social health insurance system? The Colombian case. *Health Policy Plan*. 2018;33(9):1037-46.
65. Rahimisadeh R, Mehroolhassani MH, Jafari Sirizi M, Noori Hekmat S. The analysis of National Health Accounts and financial communications network in Iran health insurance ecosystem. *BMC Health Services Research*. 2022;22(1).
66. Doshmangir L, Bazzyar M, Rashidian A, Gordeev VS. Iran health insurance system in transition: equity concerns and steps to achieve universal health coverage. *International Journal for Equity in Health*. 2021;20(1).
67. Zhu Z, Zheng W, Tang N, Zhong W. Review of Manpower Management in Healthcare System: Strategies, Challenges, and Innovations. *Journal of Multidisciplinary Healthcare*. 2024;Volume 17:5341-51.
68. Yousefinezhadi T, Mosadeghrad AM, Arab M, Ramezani M, Akbari Sari A. An Analysis of Hospital Accreditation Policy in Iran. *Iran J pub-*

- lic health. 2017;46(10):1347-1358.
69. Shahabi S, Fazlalizadeh H, Stedman J, Chuang L, Sharifabrizi A, Ram R. The impact of international economic sanctions on Iranian cancer healthcare. *Health Policy*. 2015;119(10):1309-18.
 70. Cheraghali AM. Impacts of international sanctions on Iranian pharmaceutical market. *DARU Journal of Pharmaceutical Sciences*. 2013 Jul 31;21(1):64.
 71. Kokabisaghi F. Assessment of the Effects of Economic Sanctions on Iranians' Right to Health by Using Human Rights Impact Assessment Tool: A Systematic Review. *International Journal of Health Policy and Management*. 2018;7(5):374-93.
 72. Ghanashyam B. Can public-private partnerships improve health in India? *Lancet*. 2008;372(9642):878-9.
 73. Shekhtman LM, Gates AJ, Barabasi AL. Mapping philanthropic support of science. *Sci Rep*. 2024;14(1):9397.
 74. Ghandehari K, Zahed AP, Taheri M, Abbasi M, Gorjestani S, Ahmadi AM, Nahayati MA. Estimation of Iranian stroke patients eligible for intravenous thrombolysis with tPA. *International Journal of Stroke*. 2009 Aug;4(4):236-.
 75. Ayromlou H, Soleimanpour H, Farhoudi M, Taheraghdam A, Sadeghi Hokmabadi E, Rajaei Ghafouri R, et al. Eligibility Assessment for Intravenous Thrombolytic Therapy in Acute Ischemic Stroke Patients; Evaluating Barriers for Implementation. *Iranian Red Crescent Medical Journal*. 2014;16(5).
 76. Nouri M, Azami S, Ebadi A, Tabrizi JS. Analysis of the Structure of Public Hospitals Administration in Iran: A Qualitative Study. *Health Scope*. 2021;10(2).
 77. Raman AV, Björkman JW. Public-Private Partnerships in Healthcare. In: Kuhlmann, E., Blank, R.H., Bourgeault, I.L., Wendt, C. (eds) *The Palgrave International Handbook of Healthcare Policy and Governance*. Palgrave Macmillan, London. 2015. https://doi.org/10.1057/9781137384935_23.
 78. Suchman L, Owino E, Montagu D. Recognizing and mediating bureaucratic barriers: increasing access to care through small and medium-sized private providers in Kenya. *Gates Open Res*. 2021;5:95.
 79. Sajadi HS, Majdzadeh R. Health system to response to economic sanctions: global evidence and lesson learned from Iran. *Globalization and Health*. 2022;18(1).
 80. Jafari M, Habibirad A, Pourtaieb A, Salarianzadeh MH. Health system organizational reform in governing Iranian public hospitals: A content analysis to comprehend the barriers in Board of Trustees' hospitals. *The International Journal of Health Planning and Management*. 2018;33(2).
 81. Niroomand Sadabad H, Vafaei Najari A, Houshmand E 2nd, Kokabisaghi F 3rd, Musa Farkhani E, Meraji M. Telemedicine Implementation in Resource-Constrained Settings: Challenges, Strategies, and Insights from a Qualitative Study of Iran's Healthcare System, *JMIR Human Factors*. 24/06/2025:78284 (forthcoming/in press).
 82. Foo CD, Yan JY, Chan ASL, Yap JCH. Identifying Key Themes of Care Coordination for Patients with Chronic Conditions in Singapore: A Scoping Review. *Healthcare*. 2023;11(11).
 83. Alharby BSF, Alsuwailimi Bk, Alzehairi FM, Al zuair SMS, Safar FA, Alenezi BS, et al. Critical Analysis of Cross-Cutting Themes in Healthcare Systems and Practices. *Journal of Ecocumanism*. 2024;3(8).
 84. Torkzadeh L, Jalilian H, Rahmani H, et al. Value-Based Market Segmentation of West Asian Medical Tourism Market: A Case of Iran. *Iran J Public Health*. 2024 Apr;53(4):924.
 85. Mohammadshahi, M; Tolouei Rakhshan S, Nateghinia S, et al. The Impact of Economic Sanctions on Health and Strategies for Mitigation: A Glance at the Case of Iran. *Int J Prev Med*. 2025;16:51.