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Analysis of drug procurement processes in public health administration: a systematic review

Análisis de los procesos de adquisición de medicamentos en la administración pública de salud: una revisión sistemática

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Abstract

The objective of the study was to investigate the relationship between operational management efficiency and drug procurement processes in public hospitals, through the availability, management, and sustainability of the health system. To this end, a methodology based on the PRISMA approach was used, which allowed for a systematic and comprehensive review of scientific studies published between 2022 and 2025. The search focused on indexed academic sources, using inclusion and exclusion criteria that ensured the effectiveness and credibility of the information obtained. The findings indicated that proper operational management—encompassing strategic planning, trained leadership, advanced logistics systems, and effective procurement processes—has a direct positive effect on the availability of medicines, which helps to reduce stock shortages and optimize the use of resources. On the other hand, the lack of proper implementation and shortcomings in the application of standards reduce the desired impact, undermining the quality of health services. In conclusion, the analysis shows that administrative efficiency not only optimizes procurement management but also constitutes a fundamental basis for ensuring timely access to medicines, strengthening financial sustainability, and improving patient care in the public hospital system.

Keywords: operational efficiency, administrative management, public procurement

Resumen

El objetivo del estudio fue investigar la relación entre la eficiencia en la administración operativa y los procesos de adquisición de medicamentos en los hospitales públicos, mediante la disponibilidad, gestión y sostenibilidad del sistema de salud. Para ello, se empleó una metodología basada en el enfoque PRISMA, lo que permitió realizar una revisión sistemática y exhaustiva de los estudios científicos publicados entre 2022 y 2025. La búsqueda se enfocó en fuentes académicas que están indexadas, utilizando criterios de inclusión y exclusión que garantizaban la eficacia y credibilidad de la información conseguida. Los hallazgos indicaron que una gestión operativa adecuada —que abarca la planificación estratégica, liderazgo entrenado, sistemas logísticos avanzados y procesos de contratación eficaces— tiene un efecto positivo directo en la disponibilidad de medicamentos, lo que contribuye a disminuir las deficiencias de stock y a optimizar el uso de los recursos. Por otro lado, la carencia de una implementación apropiada y las carencias en la aplicación de normas reducen el impacto deseado, perjudicando la calidad del servicio de salud. En conclusión, el análisis evidencia que la eficiencia administrativa no solo optimiza la gestión de adquisiciones, sino que también se constituye como un fundamento primordial que garantice el acceso oportuno a medicamentos, fortalecer la sostenibilidad financiera y corregir la atención a los pacientes en el sistema público hospitalario.

Palabras clave: eficiencia operativa, gestión administrativa, contratación pública

Introduction

How are drug procurement procedures carried out in public health administration, and what factors influence their efficiency, transparency, and regulatory compliance? Public health administration must execute a series of processes for drug acquisition, including needs planning, tendering, contracting, oversight, and distribution, all aimed at ensuring continuous and transparent supply in accordance with the principles of legality, efficiency, and quality (Vallés, 2024).

The need to procure medicines in healthcare facilities arises specifically from epidemiological data, consumption histories, and available drug inventories; this is followed by tendering and supplier selection through public contracting mechanisms based on current regulations. Once the contract is awarded, the purchase is formalized, and logistics are managed with monitoring of delivery compliance (Iglesias et al., 2020).

The supply of medicines in the pharmaceutical centers of public health systems has become an indispensable condition for guaranteeing the right to health and, consequently, for improving people's quality of life (World Health Organization, 2024). In many nations, particularly those with fragmented or developing health systems, medicine procurement constitutes one of the most critical aspects of public management (Valeria, 2021). In this context, the present study examines the interrelationship of public health administration processes from a systemic perspective, seeking to identify patterns, problems, best practices, and knowledge gaps.

The research problem centers on detecting situations of ineffectiveness, opacity, or even exposure to irregular practices in medicine procurement mechanisms, which generate consequences that not only impact the financial viability of the system but also restrict equitable citizen access to essential medical treatments (Tello, 2025). In many cases, the lack of adequate planning, institutional weakness, or excessive bureaucracy hinder this vital process, potentially leading to supply shortages, elevated costs, or even corruption (Vázquez, 2024).

The relevance of addressing drug procurement processes in public administration lies in their direct connection to societal well-being and social equity. Medicine procurement is not merely an administrative procedure; it is a concrete action by the State that can be decisive for the lives of thousands of citizens, as established in Article 154 of the Organic Health Law (2015). Likewise, it falls within the framework of the Organic Law of the National Public Procurement System (2024), which regulates and organizes these processes, defines the actors involved, identifies the governing regulations, and reveals the obstacles they face, thereby enabling opportunities for institutional improvement and strengthening. This research therefore aims to contribute to a better understanding of this problem from a critical, proactive, and scientifically grounded perspective.

Through a systematic and comprehensive analysis, this study seeks to provide an overview that can serve as a foundation for strategic decision-making in hospital management, particularly for assessing the economic viability of hospital institutions. The following sections present the work developed in this systematic review, describing the studies reviewed, the inclusion and exclusion criteria, the most relevant findings, and a critical discussion of the results obtained, with the purpose of contributing elements that may assist institutional managers and public policy formulators in the search for more sustainable, effective, and equitable healthcare models.

Methodology

The study employed a systematic review method designed to examine and synthesize existing information on the difficulties and tactics related to drug procurement processes in public health administration. The PRISMA framework ensured an organized, transparent, and replicable process, allowing for the rigorous academic identification of the most significant financial management practices, as well as the internal and external factors influencing the economic viability of these organizations.

Identification phase

An exhaustive exploration and review of available materials related to the challenges and strategies of financial sustainability in public and private hospitals in Ecuador was conducted. A systematic literature search was carried out using prominent academic databases including Eric, Scopus, Dialnet, Springer, and Google Scholar. Searches focused on keywords such as *"private hospitals," "hospital management," "public hospitals," "healthcare management," and "resource allocation,"* using Boolean operators *AND* and *OR* to refine the relevance of the results.

Table 1

Search strategy for the study

Database	Keywords with Boolean Operators	Studies Identified
ERIC	(“financial sustainability" AND "public hospitals") OR ("private hospitals" AND "healthcare management")	32 studies
Scopus	("hospital finance" AND "sustainability") OR ("health policy" AND "public-private healthcare")	47 studies
Dialnet	("sostenibilidad financiera" AND "hospitales públicos") OR ("gestión hospitalaria" AND "sector privado")	25 studies
Google Scholar	("financial sustainability" AND "healthcare systems") OR ("cost-efficiency" AND "hospital management" AND "Ecuador")	65 studies

Springer	("hospital management" AND "resource allocation") OR ("health sector" AND "public-private partnership" AND "Latin America")	12 studies

As a result, a total of 181 records were identified. After removing 26 duplicate studies, 155 studies remained for the selection phase.

Selection phase

In this phase, to affirm the quality and relevance of the studies, inclusion and exclusion criteria based on the PRISMA model were applied:

Inclusion criteria were: articles published between January 2020 and March 2025; publications in Spanish or English; research focused on the different drug procurement processes in public health administration; studies developed in the context of higher education or relevant associated contexts.

Exclusion criteria included: duplicate articles or those written in languages other than Spanish or English; research focused on other areas of drug procurement procedures in public health administration; works without access to the full text or lacking methodological rigor; opinion articles, editorials, or essays without scientific foundation.

Eligibility phase

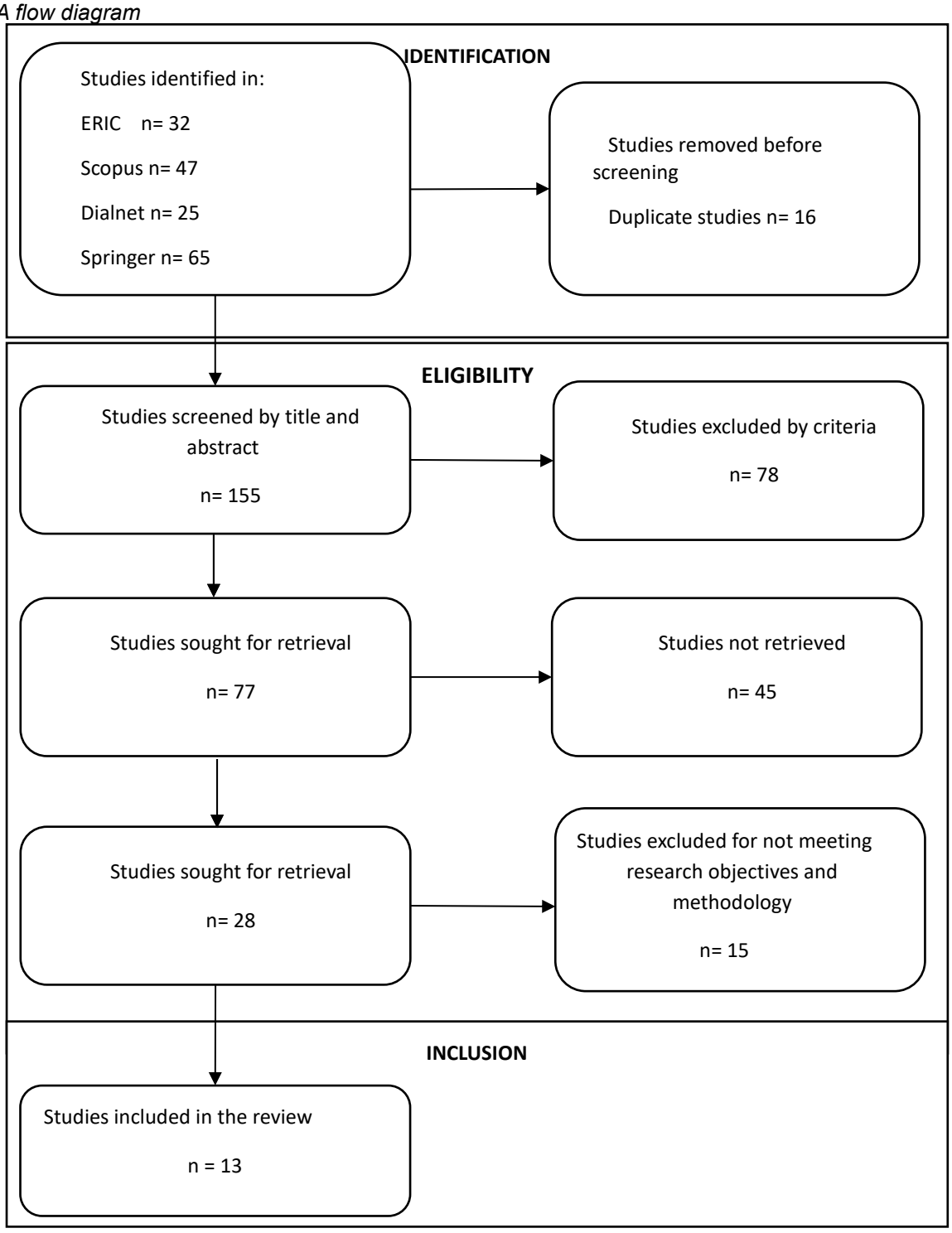
A review of 155 studies by title and abstract was conducted, with 78 discarded for not aligning with the research objectives. Of the remaining 77, full texts were sought, but 45 could not be retrieved due to access restrictions. Additionally, 15 articles were excluded after full review for the following reasons: relevance of the methodological approaches employed; pertinence of the health context in which drug procurement in public administration was applied.

Inclusion and synthesis phase

Finally, 13 studies were included for the definitive analysis, all of which met the established criteria. These were subjected to an in-depth analysis to extract relevant findings on the benefits of drug procurement in public health administration.

Figure 1

PRISMA flow diagram



Results and discussion

Administrative and operational factors in hospital drug procurement

The results of various studies addressing administrative and operational factors in hospital drug procurement are presented below. Relevant information from investigations conducted in recent periods is compiled, highlighting how these factors have influenced the stages of drug procurement.

Table 2

Systematic review results focusing on administrative and operational factors

No.	Authors & Year	Article Title	Study Type	Results	Relationship to Administrative and Operational Factors
1	(Pizarro et al., 2022)	Optimization of Economic Resources for Purchases of Medicines and Medical Supplies, Applying Deterministic and Stochastic Mathematical Models	Quantitative non-experimental design; data collected through the National Public Procurement System (SERCOP) portal	59 million dollars were invested in purchases of medicines and medical supplies between 2017 and 2020. The processes involved direct purchases from suppliers due to stockouts. The application of deterministic and stochastic inventory models proposed in this research could solve these problems to achieve resource optimization.	The lack of proper planning and reactive responses to product shortages result in hasty decisions, such as direct procurement of goods. Their suggestion to apply mathematical models for inventory management not only contributes to improving resource utilization but also proposes a fundamental shift in the decision-making approach within administration.
2	(Macias et al., 2024)	Audit of Public Procurement Processes in Ecuadorian Health Units	Basic, non-experimental, descriptive research presenting elements related to the importance of auditing as a control process over public procurement	It is concluded that auditing public procurement in the health sector in Ecuador constitutes an expression of control over inappropriate attitudes that, in addition to tarnishing the system's image, undermine the quality of care and population satisfaction with the service provided.	Their research indicates that inadequate controls in procurement processes can cause irregularities, which damage the institution's image and affect service quality. Therefore, auditing is not merely an administrative task; it is an operational necessity to guarantee transparency, efficiency, and public trust.
3	(Rodríguez, 2021)	Factors Affecting the Allocation of Economic Resources and Budget Execution at the Chone Basic Hospital – IESS	Non-experimental research with a cross-sectional, exploratory, and descriptive design	The results establish the influence of various factors on the designation and execution of budget resources. Lack of knowledge about planning, evaluation, control, and budget execution highlights the insufficient training of personnel across different areas, despite the staff working in the hospital's finance department, leading to non-fulfillment of the Medical Unit's objectives.	The study shows that insufficient training of administrative personnel hinders the institution's operational effectiveness, generating budget deviations that complicate the timely procurement of essential medicines and the achievement of strategic goals.

4	(Mazón et al., 2023)	Management of Public Procurement Processes and Their Impact on the Logistics of Public Hospitals: A Bibliographic Review Article	Analysis through databases (SOPAS, Web of Science, SciELO Direct) executing an exploration of information and creating a litigation	Transparency in procurement processes and accountability are crucial due to acts of non-compliance with regulations and corruption, which are significant concerns. In the healthcare field, the need to obtain specific services and products is frequent. Managing delivery times is fundamental to ensuring the uniformity of healthcare.	The study highlights that public health procurement management should focus not only on transparency and legality but also on operational efficiency in logistics. Their analysis advocates for a more rigorous administrative approach and a more agile operational process, especially in situations where time is a critical resource.
5	(Alcántara et al., 2022)	Strategic Management Applied to the Procurement Process of a Public Hospital	Documentary research at a descriptive level applied, using a quantitative approach and non-experimental design	It can be identified that purchases in public hospitals are not executed at one hundred percent due to the structuring with the involved areas, taking into consideration the laws governing procurement.	The study suggests that strategic management requires stronger leadership and more structured operational coordination—key factors for improving procurement processes.
6	(Cajo & Negrete, 2025)	Government Policies and Their Impact on the Supply of Medicines and Medical Devices at the Provincial General Teaching Hospital Riobamba of the MSP, Period 2021-2023	Quantitative descriptive analysis, longitudinal, determining the development of supply and its relationship with the Regulation	Budget execution defined historical levels of 100% for devices and 94% for medicines in 2022, indicating a significant improvement in management effectiveness. Sequential and adaptive policy adjustments would substantially improve medical supply management, although opportunities remain to consistently achieve the 90% target established by the MSP.	By analyzing proposals such as the Substitute Regulation and the Medicine Close Plan, these demonstrate that a phased, flexible, and technically supported implementation can significantly increase efficiency in both administration and operations, although challenges still persist.
7	(Villacrés & Mena, 2021)	Payment Mechanisms and Financial Resource Management for the Consolidation of the Ecuadorian Health System	Systematic analysis using databases from Pubmed, SciELO, LILACS Ecuador, and LILACS	The creation of these modifications would generate improvements in the health system's efficiency, risk diffusion, rewards for achieving health objectives, in addition to contributing to its sustainability and	Financial management from a broader perspective of the health system. They indicate that although payment methods are designed to enhance efficiency and sustainability, legal, policy, and operational constraints impede their

				advancing universal health coverage. However, legal, policy, and operational limitations impede their proper implementation.	correct application. This gap between technical design and actual execution emphasizes the urgent need to improve the administrative and operational capacities of the system to achieve fair and effective coverage.

The discussion indicates that, from an economic standpoint, works such as those by Pizarro et al. (2022) and Rodríguez (2021) suggest that budget management leaves much to be desired, marked by low expenditure execution, a lack of coordination between financial and technical departments, and decisions made hastily in response to resource scarcity.

On the administrative front, Macias et al. (2024) and Alcántara and colleagues (2022) highlight the scarcity of experience and training among personnel responsible for public procurement, as well as the weak application of regulations and audits. These deficiencies create a lack of transparency in administration, negatively impact spending quality, and hinder process monitoring.

Regarding operational factors, studies by Mazón et al. (2023) and Cajo and Negrete (2025) emphasize the importance of logistics management, the application of public policies, and the use of control methods to optimize supply. Managing delivery deadlines, supplier monitoring, and the adoption of digital tools are elements still undergoing improvement but are critical for ensuring continuity of care in hospitals. The research by Villacrés and Mena (2021) broadens the debate by noting that, despite payment and financing methods aiming to modernize the system, they still face political obstacles that limit their effectiveness.

Impact of operational efficiency on the economic viability of hospitals

The following table analyzes the impact of operational efficiency on drug procurement in healthcare centers, aiming to establish its relationship with administered public policy.

Table 3

Systematic review results on the impact of administrative operational efficiency

No.	Authors & Year	Article Title	Study Type	Results	Relationship to the Impact of Operational Efficiency in Hospitals
1	(Borja & Negrete, 2025)	Acquisition of SICM2022 Cataloged Medicines and Its Impact on the Medicine Supply of the Provincial General Teaching Hospital Riobamba, Period 2022 to 2023	Quantitative descriptive longitudinal analysis; the study examined 270 investigations using statistical tools	Adaptive and dynamic purchasing tactics, influenced by ministerial decrees, demonstrate a positive effect on maintaining elevated inventory levels. The transformation of ministerial decrees evidenced a 51.58% increase in medicine reserves and a significant reduction in stockout situations.	Effective administrative operations can positively influence the availability of medicines. The study demonstrates that efficient management, based on longitudinal statistical analysis, can optimize resources and facilitate timely access to essential health supplies.
2	(Jara & Rosas, 2024)	Acquisition of Goods and Services and Administrative Management in a Public Hospital in Lima	Qualitative descriptive study with a population of 30 institutional directors, surveyed via two validated	The procurement process of goods and services and administrative management at HGAI-ESSALUD Lima (r= 0.050 and p-value = 0.794) indicates that, in practice, the entity's procurement and contracting system	The operational efficiency of administration is not reflected in positive results; however, the study determines a mild correlation between administrative management and the acquisition of goods,

			and reliable questionnaires	(Supreme Decree No. 082-2019-EF, State Contracting Law and its regulations) is adequate and contributes to the country's economic and social development and meets population needs.	indicating that having a regulatory framework also highlights the need to endow hospital structures with institutional and human capacities so that they cease to be mere offices and achieve results.
3	(Faz & otros, 2023)	Public Contracting in Ecuador: Analysis and Perspective	A review and documented analysis methodology was implemented, considering current and valid regulations	Results indicated that lack of annual programming and budget allocation are the main problems to be resolved regarding public contracting in the country. It is fundamental and necessary to carry out new instructions determined by the Organic Law of the National Public Procurement System to develop a system of agreement that is efficient, transparent, and dynamic, directly benefiting the nation and its inhabitants.	Administrative efficiency in public procurement in Ecuador faces significant obstacles, especially in annual planning and adequate budget allocation, emphasizing the urgent need to implement modern and transparent mechanisms, as detailed in the Organic Law of the National Public Procurement System, thereby improving efficiency and reducing delays and excessive costs.
4	(Vargas, 2022)	Analysis of Supply Management in Hospital Logistics	Qualitative descriptive methodology, based on review articles on hospital logistics in healthcare centers	Results indicated the proposal of improvement models in the combined supply chain, SIPOC, periodic and continuous review Economic Order Quantity. Likewise, studies were identified that establish continuous improvement strategies, focused on hospital logistics phases such as control, production, and distribution of medicines, reaching the final consumer or patient.	The adoption of effective operational models can revolutionize medicine supply administration and operational effectiveness in management, reflected in the hospital's capacity to supervise and coordinate critical stages such as production, storage, and distribution, ensuring that patients receive their medications punctually.
5	(Cerda-Bustos, 2023)	Effects of New Public Management on Performance: Analysis of Chilean Public Hospitals	The study was developed using an inductive analytical method based on data from 181 Chilean public hospitals through the High Public Management System (SADP)	Results on the development of a reform considered under the NPM show evidence of the incorporation of professionals occupying senior management positions in Chilean public hospitals, increasing their performance and highlighting the importance of maintaining a professional profile.	The New Public Management reform in Chile indicates that operational efficiency in public hospitals is deeply linked to the quality of administrative leadership. Effective direction from senior levels allows for greater coherence in the application of procurement processes in healthcare.

6	(Ramirez, 2023)	Efficient Mechanisms for the Analysis of Public Contracting in Ecuador	Systematic, controlled, critical, and creative legal research, whose purposes are the search, inquiry, and study of norms, facts, and values	Efficient processes, upon analysis of public contracting in Ecuador, concluded that public contracting forms part of both governments and state enterprises of goods, works, and services, making public contracting management a fundamental part of taxpayers' contribution and promoting a country's economy.	Effective mechanisms that turn this activity into a driver of economic and operational efficiency in the health sector. The study highlights the need to review and update institutional procedures to ensure that operational performance aligns with the strategic objectives of the health system.

The body of research underscores the importance of operational effectiveness in the administrative management of medicine procurement processes within the public health sphere. Borja and Negrete (2025) present a successful example where the implementation of flexible approaches, aligned with ministerial guidelines such as the SICM2022 catalog, resulted in a notable increase in medicine availability, evidencing management grounded in concrete data and clear objectives.

On the other hand, Jara and Rosas (2024) point out that having an appropriate regulatory framework is insufficient without effective execution in practice. The disconnect between regulation and its actual implementation impedes genuine improvements, highlighting the importance of having trained and committed administrators.

Faz et al. (2023) propose strategic planning as an essential element within administrative functioning, emphasizing that the lack of planning and adequate financial resources can cause the complete collapse of the procurement system. In a similar perspective, Vargas (2022) focuses on hospital logistics, where effective operational models such as EOQ and SIPOC refine the flow of medicines and ensure their timely availability. From an institutional approach, Cerda-Bustos (2023) emphasizes that technical leadership in management positions is essential for achieving effective management, reaffirming the need to professionalize leadership in hospitals.

Ramírez (2023) highlights the essential role of public contracting mechanisms, indicating that their correct implementation not only optimizes financial efficiency but also promotes responsible use of public resources and improves patient service.

Conclusions

The detailed analysis of the investigated studies indicates that operational effectiveness in management is crucial for successfully achieving medicine procurement processes in public hospitals. Strategic administration, grounded in organization, firm technical leadership, well-organized logistics, and clear contracting procedures, not only increases the availability of medical supplies but also maximizes the use of public resources. This, in turn, reinforces the viability of the health system and the quality of service provided to patients. Conversely, the absence of effective implementation, adequate planning, or solid direction becomes a significant obstacle that restricts the impact of any current regulation.

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