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The Impact of Currency Depreciation on Medicine Availability: A Case Study of Pakistan's Hospital Supply Chains

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Abstract

The healthcare system in Pakistan heavily depends on imported materials, APIs, and lifesaving drugs. On the other hand, the country is facing a continuous depreciation of its currency against major foreign currencies.[1] Pakistani hospitals, as a result, often experience delays in imports and scarcity of medicines as this depreciation increases the procurement costs. This shortage puts patients with critical diseases like cancer, diabetes, asthma, etc., at risk. This research was designed to analyses the situation in various hospitals of Karachi, Lahore, and Islamabad with pharmacists, procurement officers, and supply chain managers as its primary respondents. Findings indicated several factors for the negative impact of currency devaluation on the availability of drugs in the country's hospital supply chains.

Keywords: Currency depreciation, medicine availability, Pakistan, hospital supply chains.

INTRODUCTION

The healthcare system in Pakistan heavily depends on imported materials, APIs, and lifesaving drugs. On the other hand, the country is facing a continuous depreciation of its currency against major foreign currencies. Pakistani hospitals, as a result, often experience delays in imports and scarcity of medicines as this depreciation increases the procurement costs. This shortage puts patients with critical diseases like cancer, diabetes, asthma, etc., at risk. Pakistan is one of those developing nations where Currency depreciation is a significant factor in creating a shortage of important medicines in Pakistan's hospital supply chains. When the local currency depreciates, the procurement costs dramatically increase. The shortage is worse in public hospitals due to limited budgets, complex procurement systems, and inept inventory management. Private hospitals also face supply issues, which demonstrates that no aspect of the healthcare system is immune. Principally, the shortages in the country are due to systemic inadequacies in regulation and supply chain management, which predict that periodic crises are expected to happen due to fluctuations in the national currency value because of systemic inadequacies.

[1] CNY, EUR and USD.

Objectives

- Evaluate the correlation between currency depreciation and the availability of vital drugs in Pakistani hospitals.
- To identify the medicines most affected by currency fluctuations.
- To evaluate the coping strategies used by hospital pharmacies and procurement departments.
- To recommend policies that can strengthen resilience against economic shocks.

Research Questions

- How does currency depreciation affect the procurement of medicines in Pakistani hospitals?
- Which categories of medicines are most vulnerable to currency-driven shortages?
- What strategies are currently used by hospitals to manage supply chain disruptions caused by depreciation?
- What policy interventions can reduce the impact of currency depreciation on medicine availability in Pakistan?

Significance of Study

This research will help policymakers, the DRAP, and hospital administration develop financial and operational measures to ensure pharmaceutical availability during currency volatility. It will also add to academic discussion on the nexus of economics and healthcare supply chain resilience.

LITERATURE REVIEW

Earlier global researches indicate that in the low- and middle-income countries, the problem of currency depreciation significantly results in the scarcity of essential medicines (Wirtz et al., 2017). The currency depreciation raises import prices, interfering with procurement cycles and limiting the availability of lifesaving medicines. Regional studies for South Asia also indicate that the developing nations depend on imported products, and this makes the healthcare system more vulnerable. These countries, including Pakistan, also lack strict regulations (Zaidi et al., 2013). Pakistan, between 2018 and 2023, experienced severe scarcity of imported medications due to the significant depreciation of its currency (Soharwardi et al., 2021). Life-saving medications are often in short supply due to various patterns of economic pressure. These medicines include insulin, antibiotics, and cancer medicines, which are critically essential for managing these chronic diseases and giving emergency treatments.

The frequent shortages of essential medications demand a serious and resilient healthcare policy that could cope with currency depreciation and support the healthcare system in Pakistan, because the country relies on imported APIs and medicines disrupted by exchange rate fluctuations. In times of crisis and currency depreciation, it becomes very difficult and to maintain supply because importers incur raised prices of medications and stop maintaining costs under current pricing regulations (Ali et al., 2025; Bhatti, 2023b). Researches also indicate that currency depreciation and less availability of foreign funding make 10-15% of essential and life-saving medications scarce (Bhatti, 2023a). Similarly, some reports note shortages exceeding 25%, especially for common analgesics and antibiotics (Xavier, 2024; ACPPOA, 2023). A deeper look by Bhatti

(2023c) and Ali et al. (2025) highlights that depreciation coupled with a punitive pricing policy under the Drug Regulatory Authority of Pakistan (DRAP forthwith) has made the import of critical medicine including oncology therapies, vaccines, anesthesia gases, and biological products—economically unviable (Bhatti, 2023a; Recorder Report, 2023). These shortages mirror earlier observations that pharmaceutical supply is highly sensitive to currency fluctuations (Rauf et al., 2024; Sarfraz, 2019).

Persistent constraints in adjusting medicine prices exacerbate shortages. Importers have been rendered financially unsustainable due to a three-year restriction under the DRAP pricing policy, which limits how frequently hardship-based price adjustments can be made (Bhatti, 2023a). As reported, this inflexibility has resulted in acute shortages of drugs like Heparin, anesthetic gases, fertility treatments, and monoclonal antibodies (Bhatti, 2023b; Bano, 2023).

Raw material disruptions and increased logistical costs have further stressed medicine supply chains. For example, Ferozsons Laboratories reports that rupee depreciation, elevated freight charges, and surging utility tariffs led to a 40% shortage in daily-use medications (Rauf et al., 2024; Gilani, 2023). Anecdotal data also show that prices of many cancer drugs increased by 30–40%, with some products witnessing surges of 100–200% due to compounded inflation and currency devaluation (Azad, 2019). Currency devaluation pervades not just pharmaceuticals but the broader healthcare supply infrastructure. According to reports, banks' unwillingness to provide letters of credit, caused by rupee instability, suspended the supply of vital medical equipment—including stents, heart valves, and diagnostic materials—with countrywide clinical repercussions (Sajid, 2023; Ali et al., 2025; Mirza & Lodhi, 2024).

Beyond chronic drug shortages, currency-induced supply crises have a direct influence on vital interventions. A dramatic example was the suspension of kidney, liver, and bone marrow transplants at the Pakistan Kidney and Liver Institute & Research Centre due to a lack of Anti-Thymocyte Globulin (ATG), a life-saving immunosuppressant, as a result of dollar liquidity shortages (Xavier et al., 2024). The Pakistani healthcare system is facing a severe medicine scarcity situation that is inextricably linked to currency depreciation, policy inflexibility, and cost increases. The convergence of import dependency, failing price adjustment systems, and rising logistical costs is a significant systemic risk. Addressing these structural and economic hurdles is critical for preventing disruptions in patient care and maintaining hospital supply chains.

METHODOLOGY

This study employed a mixed-methods research design, combining both quantitative and qualitative approaches. The research was conducted in selected tertiary-care hospitals located in Karachi, Lahore, and Islamabad, focusing on pharmacists, procurement officers, and supply chain managers as the primary respondents. A purposive sampling technique was used to target hospitals that have recently experienced medicine shortages linked to currency depreciation. Data collection consisted of two components: a structured questionnaire to gather quantitative data on medicine stock outs, price fluctuations, and procurement delays; and semi-structured interviews with pharmacists, procurement officers, and officials from the DRAP to gain qualitative insights into coping strategies and policy challenges. Quantitative data was analysed using descriptive statistics and correlation analysis to identify relationships between currency depreciation and medicine availability, while qualitative data was analysed thematically to highlight recurring patterns and strategies. Ethical considerations were scrupulously observed, including informed consent, confidentiality, and official approval from relevant institutional review boards.

Expected Findings

i. A strong correlation between rupee depreciation and shortages of imported medicines.
ii. Oncology and critical-care medicines are likely the most affected.
iii. Hospitals with digital inventory systems and diversified suppliers may show better resilience.
iv. Policy gaps in regulating price adjustments and maintaining buffer stocks will be highlighted.

ANALYSIS OF DATA

Data from tertiary-care institutions in Karachi, Lahore, and Islamabad were analysed to provide insights into the relationship between currency depreciation and the supply of necessary pharmaceuticals. Both quantitative and qualitative findings are presented to illustrate the depth of the problem and the coping strategies adopted by hospitals.

Quantitative Analysis

Stock outs and Availability

Survey responses from 120 pharmacists and procurement officers revealed that 72% of hospitals experienced shortages of at least five essential medicines in the past 12 months, coinciding with periods of steep rupee depreciation. The medicines most frequently reported as unavailable included oncology drugs (68%), insulin (61%), anesthetics (55%), and antibiotics (49%). Hospitals with limited supplier networks reported higher stock out rates compared to those that had diversified their procurement channels.

Table 1: Frequency of Essential Medicine Stock outs

Medicine Category	Percentage of Hospitals Reporting Unavailability (%)
Oncology drugs	68
Insulin	61
Anesthetics	55
Antibiotics	49

Procurement Costs and Delays

Data also showed a direct correlation between currency depreciation and procurement costs. A regression analysis revealed that a 10% depreciation of the rupee led to an average 15–20% increase in the procurement cost of imported medicines ($R^2 = 0.71$, $p < 0.05$). Furthermore, 64% of respondents indicated that procurement lead times had increased, with average delivery delays ranging between three and six weeks due to difficulties in opening letters of credit (LCs) and suppliers demanding advance payments in foreign currency.

Table 2: Relationship Between Currency Depreciation and Procurement Costs

Variable	Findings
10% Rupee Depreciation	15–20% increase in procurement costs
Coefficient of Determination (R^2)	0.71
Significance Level (p-value)	< 0.05
Percentage reporting procurement delays	64%
Average delivery delay	3–6 weeks
Main causes	LC opening issues, suppliers demanding advance payment

Safety Stock and Inventory Practices

Only 38% of hospitals reported maintaining safety stocks of essential medicines for more than one month. Hospitals using modern digital inventory systems demonstrated greater resilience, with stock out rates lowered by nearly 25% compared to hospitals using manual methods. This demonstrates a large gap in preparedness, especially among public sector institutions, where budget restrictions and procurement red tape restricted proactive stockpiling.

Table 3: Safety Stock and Inventory Management Practices

Inventory Practice	Percentage of Hospitals (%)	Key Observation
Maintaining >1 month safety stock	38	Limited preparedness
Using modern digital inventory systems	—	25% lower stock out rates than manual systems
Public sector institutions (manual systems)	—	Faced higher stock outs due to budget and procedural delays

Qualitative Analysis:

Perceptions of Currency Depreciation

Interviews with pharmacists and procurement officers revealed a general worry about the impact of currency devaluation on patient care. One respondent from a Lahore-based oncology hospital noted: *"We are forced to ration chemotherapy drugs because suppliers demand payment in dollars, and our budgets cannot keep up with the daily exchange rate changes."*

Coping Strategies

Hospitals reported adopting several coping strategies. These included supplier diversification, reliance on therapeutic substitution protocols, and informal borrowing arrangements between hospitals. Some private sector hospitals leveraged their financial flexibility to purchase medicines

in bulk during periods of relatively stable exchange rates, but public hospitals had little room to manoeuvres due to government procurement regulations.

Policy-Level Challenges

Many respondents expressed frustration with regulatory inflexibility. They argued that the DRAP failed to adjust medicine pricing structures in line with rapid currency fluctuations, making imports financially unsustainable. As one procurement officer stated: *"Even if the medicine is available in the international market, importers won't bring it in because our price ceilings make it a loss-making venture."*

The combined quantitative and qualitative data strongly suggest that currency depreciation has a direct, measurable impact on the availability of essential medicines in Pakistan's hospital supply chains. The shortages are most acute in specialized medicines such as oncology and biological therapies, which are almost entirely imported. Hospitals with better inventory systems, diversified suppliers, and more financial autonomy were relatively more resilient. However, systemic issues—such as delayed regulatory responses, insufficient safety stock rules, and reliance on imports—limit hospitals' ability to adjust effectively.

DISCUSSION

The findings of this research indicate that currency devaluation against major currencies of the world has a significantly and quantifiably negative impact on the availability of vital medicines in the hospital change management in Pakistan. The data collected by the quantitative method clearly showed a correlation between the quick depreciation of the Pakistani rupee and medication stock outs. Some essential medications that were notably stocked out included life-saving drugs such as those used for diabetes, anesthesia, and cancer. These findings are in line with international research done by Wirtz et al. (2017), which shows that currency depreciation is a significantly contributing factor to pharmaceutical shortages. Their research further indicates that in low- and middle-income nations, the exchange rate especially plays a vital role in the scarcity of medicines. Likewise, the particular finding for Pakistani supply chain management that a 10% depreciation in local currency impacts on the procurement expenses by 15%–25%, is in line with Xavier et al. (2024) and (Bigdeli et al. (2013). their findings indicate that fluctuations in foreign currencies have a negative impact on those health systems which heavily depend on import of medications.

The findings about the public-sector hospitals are in line with previous research done by Saeed et al. (2021). This is a regional study that shows that there are many factors in South Asia causing unavailability, worsening the supply chain instability. These factors are mostly a lack of financial independence and the absence of proper digital inventory systems. Moreover, complex procurement procedures and strict restrictions also contribute to this scarcity. Public hospitals are further unable to maintain enough safety supplies, which worsens the situation in times of difficulties and increased demand. Meanwhile, the private sector hospitals are better in financial reserves and supply chain networks, resulting in better resilience. This finding is also in line with previous research by Shen & Sun (2021) that indicates that if hospitals have financial flexibility, it will result in better stability in the supply chain.

These findings were also corroborated by qualitative data collected for this research. The respondents often indicated that legal and policy barriers act as a deterrent for importers. They were deterred because of the slow and fewer price ceiling adjustments by the DRAP. Other developing countries also face similar problems where medication imports are rendered unviable in the commercial market due to strictness in price controls and currency depreciations (Ibrahim et al., 2016). These figures indicate that an absence or failure of regulation is a contributing factor in drug shortages in Pakistan and is made worse by macroeconomic volatility. Some strategies

were found to fight this shortage, such as therapy substitutes, borrowing from other hospitals, and diversifying suppliers. However, these coping strategies are insufficient because there are fewer improvements in supply chain systems. The WHO's strategy (WHO, 2016) confirms these results as it emphasizes having robust supply chains with adaptive capabilities and structural stability, e.g. flexible sourcing and alternate options and reliable finance and procurement procedures, respectively.

CONCLUSION

Based on the findings and discussion, the following is concluded:

i. Currency depreciation is a significant factor in creating a shortage of important medicines in Pakistan's hospital supply chains.
ii. When the local currency depreciates, the procurement costs dramatically increase.
iii. Shortages of life-saving goods such as insulin, oncology medications, and anesthetics are also experienced with currency depreciation.
iv. The shortage is worse in public hospitals.
v. In public hospitals, limited budgets, complex procurement systems, and inept inventory management increase the impacts of medicine shortages manifold.
vi. Private hospitals are more resilient to the shortage of medicines.
vii. Private hospitals practice diversification of suppliers and have better financial resources to be more resilient to the shortages than government hospitals.
viii. Private hospitals also face supply issues, which demonstrates that no aspect of the healthcare system is immune.
ix. Principally, the shortages in the country are due to systemic inadequacies in regulation and supply chain management. Not only are the market factors responsible for that.
x. Periodic crises are expected to happen due to fluctuations in the national currency value because of systemic inadequacies.

Recommendations

Based on the conclusions, the following is recommended:

i. The government of Pakistan needs to implement much more flexible drug pricing rules to adjust according to the Pakistani currency fluctuations.
ii. It needs to be ensured that importers do not withdraw or store important drugs from the market where there is a time of currency depreciation, and strict actions should be taken against those who store medicines during that time.
iii. Public hospitals should be equipped with digital inventory systems.
iv. Public hospitals should be urged to keep safety stockpiles of those medicines which are important.
v. The store should be maintained for at least two or three months.
vi. Dependency should be reduced by making effective strategies for unpredictable procurement cycles.
vii. To import important medicines, the foreign exchange reserves should be properly utilised.
viii. Import of medicines should be given a priority alongside food and energy.
ix. Hospitals should formalise medicine-sharing networks and collaborate to encounter short-term shortages.
x. DRAP should be made more powerful through capacity training and quick decision-making processes.

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