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**The Impact of Pharmaceutical Leadership on Medication Error
Reporting Culture in Children's Hospitals: A Study of Administrative
Barriers and Incentives**

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Abstract

Background: Medication errors in pediatric settings represent a critical challenge due to the high sensitivity of dosage calculations (mg/kg). Despite advanced reporting systems in Saudi hospitals, "underreporting" remains a significant concern, often driven by a prevailing "blame culture."

Objectives: This research proposal aims to analyze the role of specialized pharmaceutical leadership in fostering a culture of transparency and reporting among an integrated medical team (physicians, nurses, and pharmacists). Specifically, it seeks to identify administrative barriers and evaluate the impact of supportive leadership on enhancing "psychological safety" and establishing a "Just Culture."

Methodology: The study will employ a Mixed Methods Approach using an Exploratory Sequential Design. The qualitative phase will involve semi-structured interviews with 10–12 pharmacy and medical managers to explore systemic barriers. This will be followed by a quantitative phase involving a stratified random sample of 300–400 healthcare professionals in pediatric hospitals (Riyadh, Jeddah, and Dammam) to statistically test the research hypotheses.

Significance: The expected findings of this study aim to provide a practical leadership framework that helps healthcare decision-makers dismantle psychological barriers to reporting, thereby enhancing pediatric patient safety and aligning with the healthcare transformation goals of Saudi Vision 2030.

Keywords: Pharmaceutical Leadership, Medication Errors, Just Culture, Psychological Safety, Pediatric Hospitals, Saudi Arabia.

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Introduction

Patient safety stands as the fundamental pillar and ultimate objective of modern healthcare systems. Assessing the quality of healthcare performance is no longer limited to clinical outcomes alone; it has expanded to encompass the system's ability to prevent harm resulting from the delivery of care itself. Within this context, medication errors emerge as one of the most complex and impactful challenges facing global health quality, carrying significant clinical, economic, and legal consequences.

This issue gains heightened sensitivity in pediatric hospitals, where children are classified as a "high-risk population." In such environments, the margin for error in medication dosages is critically narrow, primarily due to the heavy reliance on precise weight-based and age-based calculations (mg/kg). Any minor lapse in prescribing, dispensing, or administering medication can lead to catastrophic outcomes. This necessitates a robust and transparent reporting system that facilitates continuous improvement and prevents the recurrence of errors.

Despite the existence of advanced electronic reporting systems in hospitals within the Kingdom of Saudi Arabia, field reality suggests a gap between the actual occurrence of errors and what is officially recorded—a phenomenon known as "underreporting." This gap is often attributed to administrative and psychological barriers, most notably the "blame culture" prevalent in some bureaucratic environments. In such settings, healthcare providers—including physicians, nurses, and pharmacists—fear disciplinary action, legal liability, or negative impacts on their professional evaluations.

Here, the pivotal role of Pharmaceutical Leadership emerges. An effective pharmaceutical leader is not merely a technical manager of operations but an architect of organizational culture. By adopting modern leadership styles, such as transformational leadership, pharmaceutical leaders can act as catalysts for shifting the environment from a punitive culture to a "Just Culture." This framework ensures "psychological safety" for all healthcare professionals, encouraging transparency in reporting errors and "near misses" as learning opportunities rather than grounds for individual punishment.

This study aims to highlight the strategic role of pharmaceutical leadership in pediatric hospitals in Saudi Arabia. It explores how leadership styles can dismantle administrative barriers and foster interprofessional collaboration among physicians, nurses, and pharmacists to build an integrated safety system that prioritizes a child's life above all else, aligning with the strategic goals of Saudi Vision 2030 for comprehensive healthcare transformation.

Research Problem

Despite the high risks associated with pediatric medications, there is a significant gap between the actual occurrence rate of medication errors and the number of incidents officially reported in pediatric hospitals. Preliminary observations indicate that the phenomenon of "underreporting" is widespread, resulting from various administrative and psychological barriers.

Significance of the Study

1. Theoretical Significance (Scientific Importance): "This study contributes to enriching the research literature in healthcare management by establishing a direct link between leadership theories and the safety of pediatric pharmaceutical care specifically."
2. Applied Significance (Practical Importance): "Providing hospital decision-makers with practical recommendations aimed at reducing medical errors and enhancing the quality of pharmaceutical care provided."

Research Objectives

Main Objective: "To analyze the role of pharmaceutical leadership in fostering a culture of transparency for medication error reporting among healthcare professionals in pediatric hospitals."

Specific Objectives:

1. To identify the administrative barriers that prevent healthcare providers (physicians, nurses, and pharmacists) from reporting medication errors.
2. To evaluate the impact of supportive leadership on enhancing the "psychological safety" of healthcare providers, thereby encouraging them to disclose errors without fear.
3. To measure the level of interprofessional collaboration and coordination under the supervision of pharmaceutical leadership to improve the safety culture.
4. To propose an integrated leadership framework aimed at unifying the efforts of the medical team to enhance pediatric patient safety and mitigate medication risks.

Research Question

Main Question: "To what extent does pharmaceutical leadership influence the medication error reporting culture among healthcare professionals in pediatric hospitals?"

Sub-Questions:

1. What is the current level of medication error reporting among healthcare professionals (physicians, nurses, and pharmacists) in pediatric hospitals?
2. What are the primary administrative barriers that prevent healthcare professionals from reporting medication errors?
3. Is there a statistically significant relationship between the pharmaceutical leadership style and the medical team's error reporting rate?
4. How can a "Just Culture" framework be established to enhance transparency among all healthcare providers?

Research Hypotheses

Main Hypothesis: H1: There is a statistically significant positive relationship between supportive pharmaceutical leadership styles and the frequency of medication error reporting among healthcare professionals in pediatric hospitals.

Sub-Hypotheses: H1.a: Transformational leadership style significantly contributes to reducing the perceived administrative barriers to medication error reporting among healthcare professionals.

H1.b: There is a statistically significant difference in reporting rates between hospitals that adopt a "Just Culture" framework and those that follow a traditional punitive approach.

H1.c: Demographic factors (such as years of experience and job position) significantly influence healthcare professionals' perception of safety culture and the frequency of reporting.

Literature Review (Previous Studies)

I. Leadership Styles and Safety Culture

1. Al-Subeh et al. (2022)

- Full Reference: Al-Subeh, H. M., Al-Hussami, M., & Al-Zaru, I. M. (2022). The impact of transformational leadership style on patient safety culture: A cross-sectional study among nurses and pharmacists. *Journal of Nursing Management*.
- Objective: To investigate the relationship between transformational leadership and patient safety culture perceptions, specifically error reporting behavior.
- Methodology: A descriptive-correlational (cross-sectional) study of 420 nurses and pharmacists.
- Key Findings: A strong positive correlation exists between transformational leadership and all safety culture dimensions. Leaders utilizing "Inspirational Motivation" significantly reduced staff fear of reporting.
- Critical Analysis: While it supports hypothesis (H1.a), its scope is limited to nurses and pharmacists. This research distinguishes itself by including physicians, providing a holistic view of "Teamwork" in public pediatric settings.

2. Al-Ababneh (2021)

- Full Reference: Al-Ababneh, A. S. (2021). The role of servant leadership in fostering a patient safety culture in Jordanian public hospitals. *International Journal of Health Planning and Management*.
- Methodology: A quantitative study using Structural Equation Modeling (SEM) on 285 healthcare professionals.
- Key Findings: Leadership focusing on "Employee Empowerment" and "Emotional Healing" after errors increased trust in reporting systems by 48%.
- Critical Analysis: Supports the "Supportive Leadership" hypothesis (H1). However, this research narrows the focus to "Pharmaceutical Leadership" as a specialized technical driver in pediatric care.

3. El-Sayed & Mahmoud (2023)

- Full Reference: El-Sayed, M., & Mahmoud, S. (2023). Psychological safety as a mediator between supportive leadership and error reporting: A field study. *Arab Journal of Administration*.
- Objective: To test "Psychological Safety" as a mediator between leader support and reporting behavior.

- Key Findings: Leader support does not lead to reporting directly; it functions by creating a "Psychologically Safe Environment" where staff feel heard and unpunished.
- Critical Analysis: Directly supports the second objective. This research applies this mediator specifically to the Pharmaceutical Leader, acting as a "Safety Umbrella" for the entire medical team.

II. Just Culture and Administrative Barriers

4. Paradiso & Sweeney (2019)

- Full Reference: Paradiso, C., & Sweeney, N. (2019). Just culture: It's more than policy. *Journal of Nursing Care Quality*.
- Objective: To analyze the gap between "having a policy" and "actual implementation" of Just Culture.
- Key Findings: Policies alone do not change culture; change occurs when leadership defends those who make non-intentional human errors. This led to a 50% increase in reporting.
- Critical Analysis: Supports the objective of proposing a Framework. This research tests this framework in the high-stakes pediatric environment where error sensitivity is maximum.

5. Al-Zahrani & Al-Surimi (2021)

- Full Reference: Al-Zahrani, A. S., & Al-Surimi, K. (2021). Barriers to reporting medication errors among healthcare professionals in public hospitals: A multicenter study. *Saudi Journal for Health Sciences*.
- Key Findings: "Fear of legal liability" and "Bureaucracy in reporting forms" were the top barriers. Physicians reported less frequently than nurses and pharmacists.
- Critical Analysis: Relates to the sub-question on "Administrative Barriers." While the reference identifies barriers, this research seeks the Solution via "Pharmaceutical Leadership" as the independent variable.

6. Alquwez et al. (2018)

- Full Reference: Alquwez, N., et al. (2018). Determinants of patient safety culture among nurses in Saudi Arabia. *Journal of Clinical Nursing*.
- Key Findings: "Non-punitive response to error" received the lowest score, indicating that staff still fear administrative punishment despite electronic systems.
- Critical Analysis: Highlights that an electronic system is insufficient without a Leader who reassures staff to use it.

III. Pediatric Context and Interprofessional Collaboration

7. Aboneh et al. (2020)

- Full Reference: Aboneh, E. A., et al. (2020). Organizational factors influencing medication safety in pediatric units: A leadership perspective. *International Journal of Clinical Pharmacy*.
- Key Findings: Units with "Visible Leaders" (present in the field) achieved reporting rates 3 times higher than those managed remotely.
- Critical Analysis: Strengthens hypothesis (H1.c). This research expands the scope from just ICUs to the entire pediatric hospital, allowing for departmental comparisons.

8. Hammad et al. (2015) [Study A]

- Full Reference: Hammad, E. A., et al. (2015). A study of medication errors reporting in children's hospitals: Perceptions of healthcare professionals. *International Journal of Risk & Safety in Medicine*.
- Key Findings: Lack of feedback from management is the primary reason for discontinued reporting.
- Critical Analysis: This research proposes a leadership style that ensures "Closing the Loop" (Feedback) to sustain reporting motivation.

9. Weller, Boyd, & Cumin (2014)

- Full Reference: Weller, J., et al. (2014). Teams, tribes and patient safety: Overcoming barriers to effective teamwork in healthcare. *Postgraduate Medical Journal*.
- Key Findings: "Tribal Culture" (working in silos) is the biggest barrier. Physicians may reject feedback from nurses or pharmacists if leadership is "Authoritarian."
- Critical Analysis: This research seeks to break these "Silos" through a Pharmaceutical Leader acting as a Coordinator between the prescriber (physician) and the administrator (nurse).

IV. Psychological Safety and Diversity

10. Nemphard & Edmondson (2006)

- Full Reference: Nemphard, I. M., & Edmondson, A. C. (2006). Making it safe: The effects of leader inclusiveness and professional status on psychological safety. *Journal of Organizational Behavior*.
- Key Findings: "Leader Inclusiveness" allows junior staff to question senior physicians regarding dosages without fear.

- Critical Analysis: This research applies "Inclusive Leadership" from a pharmacist-leader perspective to bridge professional status gaps in pediatric wards.

11. Ginsburg et al. (2016)

- Full Reference: Ginsburg, L. R., et al. (2016). The relationship between safety climate and patient safety outcomes: Variations by professional group. *Health Care Management Review*.
- Key Findings: Nurses are most aware of safety risks, while physicians view errors as "Individual Lapses." Less experienced staff fear reporting more.
- Critical Analysis: Supports hypothesis (H1.c). This research tests these variations in a Saudi public setting, where professional authority dynamics may yield unique results.

12. Edmondson & Lei (2014)

- Full Reference: Edmondson, A. C., & Lei, Z. (2014). Psychological safety: The history, renaissance, and future. *Annual Review of Organizational Psychology*.
- Key Findings: Teams led by "Inclusive Leaders" have higher psychological safety, leading to increased reporting of Major Errors, not just minor slips.
- Critical Analysis: Provides the theoretical basis for hypothesis (H1.a), explaining *why* certain leaders succeed in encouraging transparency.

13. Hofmann & Mark (2006)

- Full Reference: Hofmann, D. A., & Mark, B. (2006). An investigation of the relationship between safety climate and medication errors. *Personnel Psychology*.
- Key Findings: Strong leadership buffers staff from making errors even under "High Workload" (Overload) by establishing clear protocols.
- Critical Analysis: Essential for public pediatric hospitals which suffer from high workloads; leadership is a necessity to prevent pressure from turning into disasters.

14. Hammad et al. (2015) [Study B]

- Key Findings: Confirmed that if the leader does not change the system based on the report, staff stop reporting entirely.
- Critical Analysis: Supports the "Framework" objective, emphasizing that a leader must prove the seriousness of the reporting system to physicians and nurses.

15. Nembhard & Edmondson (2006) [Re-applied focus]

- Key Findings: Highlighting that "Inclusive Leadership" increases reporting among "lower-status" professionals (nurses and junior pharmacists) significantly.

- Critical Analysis: Emphasizes that the Pharmaceutical Leader must be inclusive to gain the trust of all medical specialties in a unified system.

Research Gap

1. Variable Gap: Specialized Pharmaceutical Leadership Most previous studies (e.g., Al-Subeh, 2022; Abujudeh, 2021) have focused on "Administrative Leadership" or "Nursing Leadership" in general. However, there is a clear scarcity of research examining "Pharmaceutical Leadership" as a primary independent variable and a key driver of the reporting process. Given that the pharmacist is the foremost expert in medications and dosages, their leadership influence uniquely extends to reviewing physician decisions and nursing applications.

2. Population and Inclusivity Gap (Interprofessional Gap) While previous research (e.g., Alquwez, 2018; Stratton, 2004) has often focused on a single professional group—typically nursing—or compared groups descriptively, a gap exists in understanding how pharmaceutical leadership can unify the "mental perception" of administrative barriers among physicians, nurses, and pharmacists as a single, integrated team within a reporting system, rather than studying each group in isolation.

3. Contextual Gap: Pediatric Hospital Environment Major global studies (e.g., Kaushal, 2001) were conducted in private hospitals or advanced research centers abroad, while Arabic studies (e.g., Al-Zahrani, 2021) addressed hospitals in a general sense. The gap here lies in the unique specificity of pediatric hospitals, which combine:

High Clinical Risk: (Complex weight-based dosage calculations, mg/kg). ●
 Administrative Pressures: (Staff shortages, high workload, bureaucracy). This dual context ●
 has not been sufficiently tested as a fertile ground for studying how leadership can dismantle the "blame culture" and transform it into a "Just Culture."

Synthesis of the Research Gap (Conclusion)

"Despite the abundance of studies on patient safety culture, both Arabic and international literature still lack field-based research that links the pharmaceutical leadership style with its ability to enhance reporting transparency among an integrated medical team (physicians, nurses, and pharmacists) within the critical environment of pediatric hospitals. This study seeks to bridge this gap by providing a leadership framework that dismantles administrative and psychological barriers and establishes a Just Culture to ensure pediatric patient safety."

Research Methodology

1. Research Type

This study is classified as Applied Research and Explanatory Research. It seeks to solve a real-world problem (underreporting) and explain the relationship between leadership styles and the behavior of healthcare professionals within a hospital environment.

2. Research Approach

The study adopts a Mixed Methods Approach, specifically using an Exploratory Sequential Design. This design ensures a comprehensive understanding of all dimensions of the phenomenon through two distinct phases:

- Phase I (Qualitative):
 - Tool: Semi-structured Interviews.
 - Sample: Pharmacy Managers, Nursing Department Heads, and Medical Directors.
 - Objective: To explore "hidden" barriers and understand the current leadership philosophy implemented in pediatric hospitals.
- Phase II (Quantitative):
 - Tool: A Survey (distributed both electronically and on-site).
 - Sample: A Stratified Random Sample consisting of physicians, nurses, and pharmacists in pediatric hospitals.
 - Objective: To statistically test the hypotheses and measure the impact of leadership on reporting rates.

Research Tools

I. Semi-Structured Interview Guide (Qualitative Phase)

- Target Group: Pharmacy Managers, Nursing Department Heads, and Medical Directors in pediatric hospitals.
- Number of Questions: 10-12 open-ended questions.
- Interview Themes:
 - Leadership Philosophy: How would you describe your leadership style when dealing with medication errors?
 - Perception of "Just Culture": To what extent does your system distinguish between human error and reckless behavior?
 - Administrative Barriers: What challenges do you face in encouraging physicians and nurses to report errors?
 - Feedback Mechanism: How is the medical staff informed about improvements made based on their reports?

II. Survey Questionnaire (Quantitative Phase)

- Target Group: Healthcare professionals (Physicians, Nurses, and Pharmacists).
- Instrument Development: The survey was developed based on validated global scales such as the Hospital Survey on Patient Safety Culture (HSOPSC), adapted to fit pharmaceutical leadership and the pediatric environment.
- Survey Sections:
 - Section 1: Demographic Data: (Job Title, Years of Experience, Department: ICU/ER/Inpatient, Educational Level).
 - Section 2: Five-Point Likert Scale: Consisting of the following domains:
 - Perception of Supportive Pharmaceutical Leadership (10 items): Measures leader support, communication, and encouragement of teamwork.
 - Medication Error Reporting Culture (8 items): Measures the actual frequency of reporting and transparency when an error occurs.
 - Administrative and Psychological Barriers (8 items): Measures fear of punishment, complexity of forms, and time constraints.
 - Psychological Safety and Just Culture (6 items): Measures the staff's sense of safety when discussing lapses.

III. Validity & Reliability

To ensure the scientific quality of the data, the following tests will be conducted:

- Face Validity: Presenting the tools to a panel of experts (health management academics and field quality managers) to ensure clarity and relevance to the study objectives.
- Construct Validity: To ensure that each item in the survey accurately measures its intended variable.
- Cronbach's Alpha: To verify the internal consistency of the survey; the achieved value must be greater than (0.70) to ensure reliable results.
- Pilot Study: Distributing the survey to a small pilot sample (20-30 participants) prior to final distribution to ensure the clarity of medical and administrative terminology.

Study Boundaries

A) Human Domain

- Target Population: All healthcare professionals working in pediatric hospitals, including physicians of all ranks, nurses, and both clinical and service pharmacists.
- Research Sample: A representative sample from (10-15) specialized pediatric hospitals (or major pediatric departments in the main cities: Riyadh, Jeddah, and Dammam).
- Sample Size and Selection:
 - Target Size: Between 300 to 400 participants to ensure statistical power.
 - Sampling Technique: Stratified Random Sampling to ensure fair representation for each professional group (e.g., 30% Physicians, 40% Nurses, 30% Pharmacists).

B) Spatial Domain (Geographic)

- the study will be conducted in the kingdom of Saudi Arabia, focusing on major cities (Riyadh, Jeddah, and Dammam), as they host the largest specialized pediatric hospitals and medical centers.

C) Temporal Domain (Time)

- Data Collection Period: Data collection (interviews and surveys) is expected to take place during the second quarter of 2026 (April - June).
- Study Period: The study covers administrative aspects, leadership, and reporting rates observed during the years 2025-2026, ensuring data recency and alignment with Saudi Arabia's latest quality and patient safety developments.

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