REPORT – *Hospital Emergency Room Analysis*

1. Executive Summary

This project analyzes **9,216 emergency room (ER) patient records** collected between **April 2023 and October 2024**. The goal is to identify patterns in patient flow, wait times, satisfaction levels, and referrals, while comparing long-term (yearly) and short-term (monthly) performance.

Key findings show that while **patient satisfaction remains high (4.99/5 average)**, there are pressure points around **weekends, mornings, and young adult patients**. Targeted staffing strategies and referral planning can further optimize ER performance.

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2. Introduction & Objectives

Emergency rooms are critical in healthcare delivery but often face challenges like overcrowding, long wait times, and staffing shortages.

The objectives of this project were to:

- Track patient volume across time periods.

- Monitor waiting times and satisfaction trends.

- Identify referral patterns to departments.

- Provide actionable recommendations for hospital administration.

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3. Methodology / Process

1. **Data Collection** – Patient records (9,216 entries) covering **Apr 2023 – Oct 2024**.

2. **Data Cleaning** – Standardizing columns, handling missing values, categorizing patient ages, and formatting time.

3. **Dashboard Development** – Two interactive dashboards were created:

   o **Yearly Dashboard** – Long-term patterns.

   o **Monthly Dashboard (Aug 2023)** – Detailed short-term snapshot.

4. **Analysis** – KPIs and visuals were used to extract insights on wait time, referrals, and satisfaction.

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4. Analysis & Insights

📊 Yearly Dashboard (Apr 2023 – Oct 2024)

- **Patients:** 9,216

- **Average Wait Time:** 35.3 minutes

- **Patient Satisfaction:** 4.99 / 5

- **Referrals:** 3,816

- **Peak Days:** Mondays & Weekends

- **Peak Hours:** 08:00 – 12:00 hrs

- **Demographics:** Young adults (20–39 yrs) dominate visits.

- **Referral Departments:** General Practice & Orthopedics lead.

📊 Monthly Dashboard (Aug 2023)

- **Patients:** 494

- **Average Wait Time:** 36.4 minutes

- **Patient Satisfaction:** 5.06 / 5

- **Referrals:** 191

- **Peak Days:** Saturdays

- **Peak Hours:** 19:00 – 20:00 hrs

- **Balance:** Admissions and discharges nearly equal.

Consolidated Insights

- **Admissions:** Nearly equal split between admitted (4612) and not admitted (4604).

- **Wait Times:** 59% within 30 minutes indicates efficiency but still room for improvement (41% delayed).

- **Demographics:** Young adults (20–39 years) are most frequent visitors.

- **Department Referrals:** 5.4K cases had no referral; General Practice (1.8K) and Orthopedics (1K) were top referral departments.

- **Patient Race:** White (2.6K) and African American (2K) dominate, but diversity is significant.

- **Day-wise Trends:** Mondays (1314), Saturdays (1377), and Sundays (1318) have higher volumes.

5. Discussion

- **Wait Times:** While ~59% of patients are seen within 30 minutes, ~41% experience delays, indicating opportunities for better queue management.

- **Patient Demographics:** Young adults are the most frequent ER visitors, suggesting preventive health initiatives could reduce ER burden.

- **Staffing Patterns:** Weekends and mornings see higher patient load, requiring more staff coverage during these hours.

- **Referrals:** High demand for General Practice and Orthopedics highlights the need for additional specialists in these fields.

6. Conclusion & Recommendations

Conclusion

The analysis reveals a well-functioning ER with **consistently high satisfaction** despite workload challenges. However, there is room for improvement in **reducing wait times** and **aligning staff resources** with demand peaks.

Recommendations

1. **Dynamic Staffing** – Deploy more staff during weekends, mornings, and Saturday evenings.

2. **Referral Readiness** – Strengthen capacity in General Practice & Orthopedics.

3. **Wait-Time Management** – Improve triage efficiency to reduce the 41% delayed cases.

4. **Preventive Measures** – Launch awareness programs for young adults to reduce non-critical visits.