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INTEGRATED CLINICAL SPECTRUM OF MATERNAL AND PEDIATRIC MORBIDITY, PLASTIC SURGICAL INTERVENTIONS, MEDICO-LEGAL PRESENTATIONS, AND DRUG UTILIZATION PATTERNS IN A TERTIARY CARE HOSPITAL

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Abstract

Background: Tertiary care hospitals in developing healthcare systems manage a wide spectrum of clinical conditions that extend beyond routine maternal and pediatric care, including plastic surgical interventions, medico-legal presentations, and complex pharmacotherapeutic practices. However, integrated data evaluating these multidisciplinary clinical patterns remain limited, particularly in resource-constrained settings.
Objective: To evaluate the clinical spectrum of maternal and pediatric morbidity, plastic surgical interventions, medico-legal presentations, and drug utilization patterns in a tertiary care hospital.
Methods: This cross-sectional study was conducted in a tertiary care teaching hospital from January 2025 to December 2025. Patients presenting to the departments of obstetrics and gynecology, pediatrics, plastic surgery, emergency medicine, and medico-legal services were included through non-probability consecutive sampling. Demographic variables, clinical diagnoses, surgical interventions, medico-legal characteristics, and prescribing patterns were recorded using a structured data collection proforma. Drug utilization patterns were assessed according to the World Health Organization prescribing indicators. Statistical analysis was performed using SPSS version 26.0. Descriptive statistics were used to summarize frequencies, percentages, means, and standard deviations. Associations between categorical variables were analyzed using the chi-square test, with $p < 0.05$ considered statistically significant.
Results: A total of 620 participants were enrolled in the study. Maternal morbidity accounted for 34.5% of cases, with hypertensive disorders of pregnancy and anemia being the most common presentations. Pediatric morbidity represented 31.8% of cases, predominantly involving respiratory tract infections, acute gastroenteritis, and febrile illnesses. Plastic surgical interventions comprised 14.2% of admissions, mainly related to burn injuries, traumatic soft tissue defects, and post-surgical wound reconstruction. Medico-legal presentations constituted 11.6% of cases, including road traffic accidents, physical assault, and poisoning events. Polypharmacy was observed in 39.4% of patients, while antibiotics were prescribed in 61.2% of encounters. Significant associations were identified between prolonged hospital stay and increased drug utilization burden ($p=0.01$).
Conclusion: The study demonstrates the diverse and interconnected clinical burden encountered in tertiary healthcare institutions, emphasizing the need for multidisciplinary coordination, rational pharmacotherapy, and integrated patient management strategies. Strengthening clinical surveillance systems and evidence-based prescribing practices may improve patient outcomes and healthcare efficiency in tertiary care settings.

Keywords: Maternal Morbidity, Pediatric Morbidity, Plastic Surgery, Medico-Legal Cases, Drug Utilization Patterns, Pharmacotherapy, Tertiary Care Hospital, Cross-Sectional Study, Rational Drug Use, Clinical Spectrum

INTRODUCTION

Tertiary care hospitals represent the highest level of healthcare delivery and frequently serve as referral centers for patients with complex, multisystem, and high-risk clinical conditions. In developing countries, these institutions often encounter a broad spectrum of maternal, pediatric, surgical, emergency, and medico-legal cases simultaneously, thereby placing substantial pressure on healthcare infrastructure, clinical decision-making, and resource allocation. The growing burden of communicable and non-communicable diseases, trauma-related injuries, irrational drug prescribing, and emergency presentations has further complicated patient management within tertiary healthcare systems [1,2].

Maternal morbidity remains a major public health concern worldwide, particularly in low- and middle-income countries where preventable complications continue to contribute significantly to maternal mortality and long-term disability. Hypertensive disorders of pregnancy, obstetric hemorrhage, anemia, puerperal sepsis, and gestational diabetes are among the most frequently reported causes of maternal morbidity requiring tertiary-level management [3,4]. According to the World Health Organization (WHO), nearly 95% of maternal deaths occur in resource-limited settings, highlighting persistent disparities in access to timely obstetric care and evidence-based interventions [5]. In addition, delays in diagnosis, inadequate antenatal care, and limited multidisciplinary coordination may worsen maternal outcomes in overcrowded hospital environments.

Similarly, pediatric morbidity contributes substantially to hospital admissions and healthcare utilization in tertiary institutions. Respiratory tract infections, diarrheal diseases, malnutrition, febrile illnesses, and neonatal complications remain leading causes of pediatric morbidity and mortality in developing regions [6]. Despite improvements in vaccination programs and child health initiatives, infectious diseases continue to impose a considerable clinical and economic burden on healthcare systems [7]. Furthermore, pediatric patients frequently require individualized pharmacological management because of age-related variations in drug metabolism, dosing requirements, and susceptibility to adverse drug reactions.

Plastic surgery services have also evolved into an essential component of tertiary healthcare facilities. Beyond cosmetic procedures, reconstructive plastic surgery plays a critical role in the management of burn injuries, traumatic soft tissue defects, congenital anomalies, post-oncologic reconstruction, and chronic wound care [8]. Burn injuries alone represent a major public health challenge in South Asia and other developing regions, often resulting in prolonged hospitalization, functional impairment, psychological distress, and increased healthcare expenditure [9]. The integration of plastic surgical services within multidisciplinary hospital settings is therefore necessary for improving both functional and aesthetic patient outcomes.

In parallel, medico-legal cases constitute an important yet underexplored domain within tertiary healthcare institutions. Emergency departments frequently receive patients involved in road traffic accidents, interpersonal violence, poisoning, sexual assault, and occupational injuries, many of which require medico-legal documentation and forensic evaluation [10]. The increasing incidence of trauma and violence-related presentations has generated additional medico-legal responsibilities for healthcare professionals, particularly in densely populated urban settings [11]. Effective management of such cases requires close collaboration between clinicians, emergency physicians, forensic specialists, and law enforcement agencies to ensure accurate clinical assessment and legal reporting.

Drug utilization patterns represent another critical determinant of healthcare quality and patient safety in tertiary care environments. Irrational prescribing practices, excessive antibiotic use, polypharmacy, and inappropriate medication combinations contribute to adverse drug reactions, antimicrobial resistance, prolonged hospital stay, and increased treatment costs [12]. The WHO prescribing indicators have been widely used to assess rational drug use and optimize pharmacotherapeutic practices in hospital settings [13]. In resource-constrained healthcare systems, monitoring prescribing trends is particularly important for promoting evidence-based medicine, minimizing medication-related complications, and improving overall healthcare efficiency.

Although several studies have independently evaluated maternal morbidity, pediatric illnesses, plastic surgical outcomes, medico-legal presentations, or prescribing practices, integrated multidisciplinary analyses encompassing these interconnected domains remain scarce. Most published literature focuses on isolated specialties, thereby limiting understanding of the collective clinical burden encountered in tertiary healthcare institutions [14,15]. Comprehensive evaluation of these overlapping clinical patterns may provide valuable insights into healthcare utilization, interdisciplinary coordination, and institutional resource planning.

Therefore, the present study was designed to evaluate the integrated clinical spectrum of maternal and pediatric morbidity, plastic surgical interventions, medico-legal presentations, and drug utilization patterns in a tertiary care hospital. The findings of this study may contribute to evidence-based policy development, rational prescribing strategies, and multidisciplinary patient management approaches aimed at improving healthcare delivery and patient outcomes in tertiary care settings.

MATERIALS AND METHODS

Study Design and Setting
This cross-sectional observational study was conducted at a tertiary care teaching hospital Lahore from January 2025 to December 2025. The study was designed to evaluate the integrated clinical spectrum of maternal and pediatric morbidity, plastic surgical interventions, medico-legal presentations, and drug utilization patterns among patients presenting to multiple clinical departments, including obstetrics and gynecology, pediatrics, plastic surgery, emergency medicine, and medico-legal services.

Study Population
The study population comprised patients admitted or managed in the selected departments during the study period. Both inpatient and emergency department cases were included to ensure comprehensive assessment of the multidisciplinary clinical burden encountered in tertiary healthcare settings.

Sample Size and Sampling Technique
A total of 620 participants were enrolled using a non-probability consecutive sampling technique. All eligible patients presenting during the study duration and fulfilling the inclusion criteria were recruited consecutively until the required sample size was achieved.
The sample size was considered adequate for estimating the frequency and distribution of major clinical presentations and drug utilization patterns within the study population.

Inclusion Criteria
The following patients were included in the study:
1. Pregnant women or postpartum patients diagnosed with maternal medical or obstetric morbidity.
2. Pediatric patients aged below 14 years presenting with acute or chronic medical illnesses.
3. Patients undergoing reconstructive or emergency plastic surgical interventions, including burns, traumatic soft tissue injuries, wound reconstruction, and congenital deformities.
4. Patients presenting with medico-legal conditions such as road traffic accidents, poisoning, assault, burns, or other trauma-related events requiring medico-legal documentation.
5. Patients admitted for at least 24 hours or evaluated in emergency and specialty departments during the study period.
6. Patients or guardians providing informed consent for participation.

Exclusion Criteria
The following patients were excluded from the study:
1. Patients with incomplete medical records or missing clinical information.
2. Individuals unwilling to participate or refusing informed consent.
3. Patients managed on an outpatient basis without adequate clinical documentation.
4. Elective cosmetic surgical procedures without reconstructive or emergency indications.
5. Patients transferred to other institutions before completion of clinical evaluation.
6. Duplicate admissions or repeated entries of the same patient during the study period.

Data Collection Procedure
Data were collected using a structured and pre-validated data collection proforma developed according to study objectives and relevant literature. Information was obtained from patient medical records, admission files, prescription charts, operative notes, laboratory reports, and medico-legal documentation.
The collected variables included:
- Sociodemographic characteristics (age, gender, residence)
- Clinical diagnoses and comorbidities
- Maternal and pediatric disease patterns
- Types of plastic surgical interventions
- Nature of medico-legal presentations
- Duration of hospital stay
- Prescribed medications and therapeutic categories
- Number of drugs prescribed per encounter
- Antibiotic utilization patterns
- Polypharmacy indicators

- Clinical outcomes and discharge status

Drug utilization assessment was performed according to the prescribing indicators recommended by the World Health Organization, including average number of drugs per prescription, frequency of antibiotic prescriptions, use of injectable medications, and generic prescribing practices.

Study Variables

The primary outcome variables included:

- Frequency and pattern of maternal morbidity
- Distribution of pediatric illnesses
- Types of reconstructive plastic surgical procedures
- Spectrum of medico-legal cases
- Drug prescribing and utilization patterns
- Secondary variables included demographic characteristics, hospital stay duration, and associations between clinical presentations and medication burden.

Statistical Analysis

Data were entered and analyzed using Statistical Package for Social Sciences (SPSS) version 26.0. Continuous variables were expressed as mean ± standard deviation, whereas categorical variables were presented as frequencies and percentages.

The chi-square test was applied to assess associations between categorical variables, including relationships between duration of hospitalization and drug utilization burden. A p-value of less than 0.05 was considered statistically significant.

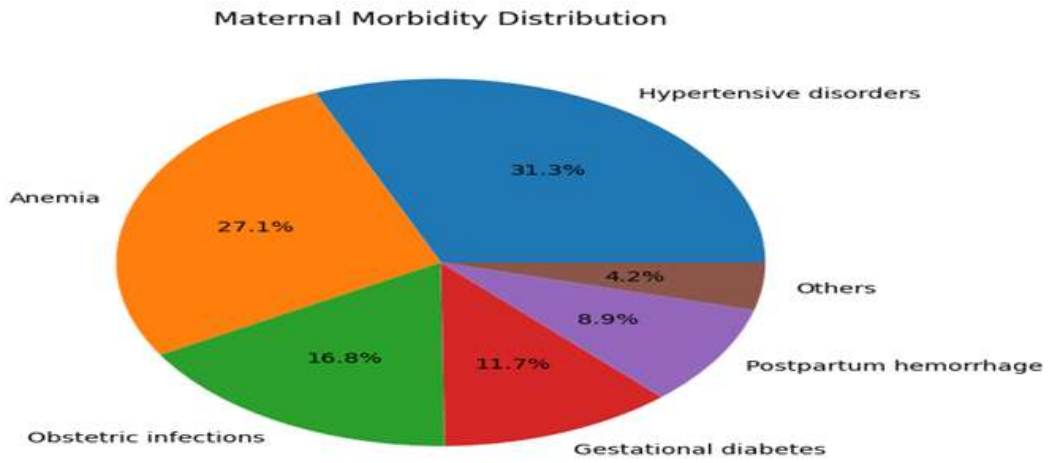
Ethical Considerations

Ethical approval for the study was obtained from the Institutional Ethical Review Committee prior to commencement of data collection. Written informed consent was obtained from adult participants and from parents or legal guardians of pediatric patients. Patient confidentiality and anonymity were strictly maintained throughout the study in accordance with the principles of the Declaration of Helsinki.

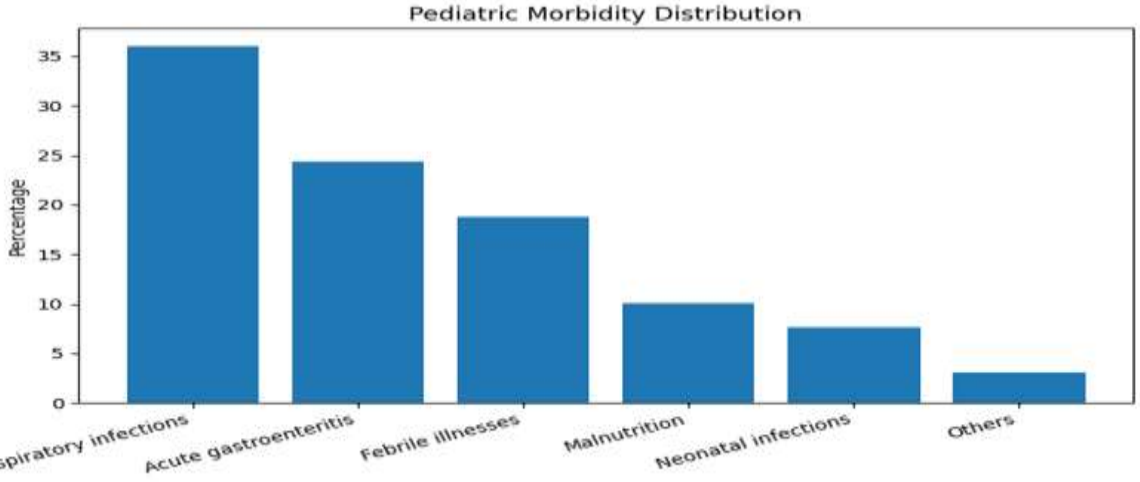
RESULTS

A total of 620 participants were enrolled during the study period. The mean age of the study population was 29.7 ± 14.2 years, with females constituting 58.4% of cases and males accounting for 41.6%. Most participants were admitted through emergency and specialty referral services.

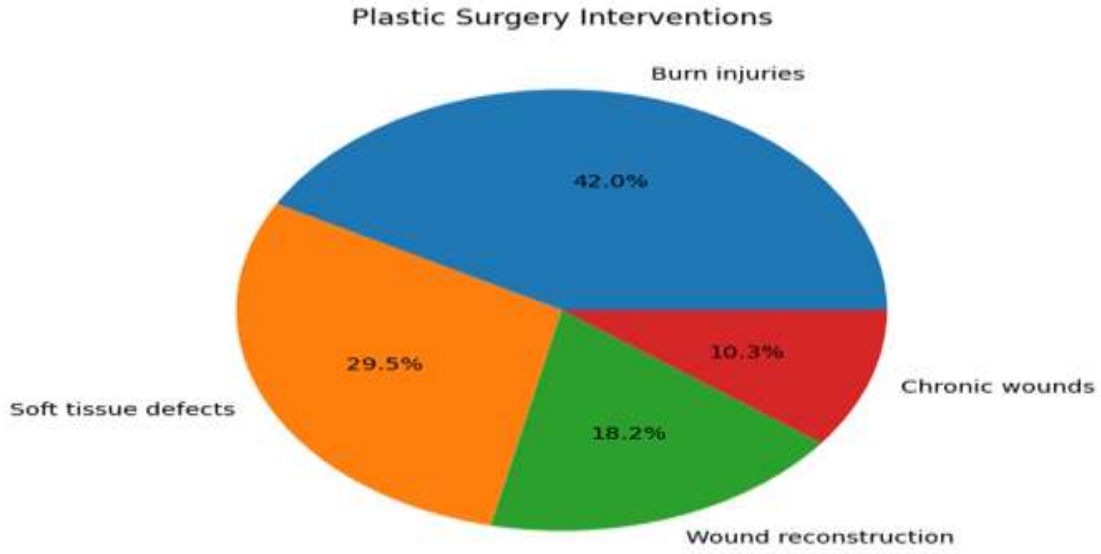
Maternal morbidity represented 34.5% (n=214) of the total study population. Among maternal cases, hypertensive disorders of pregnancy were the most frequent presentation, accounting for 31.3% of maternal admissions, followed by anemia (27.1%), obstetric infections (16.8%), gestational diabetes mellitus (11.7%), and postpartum hemorrhage (8.9%). A smaller proportion of patients presented with other obstetric complications including preterm labor and puerperal sepsis.



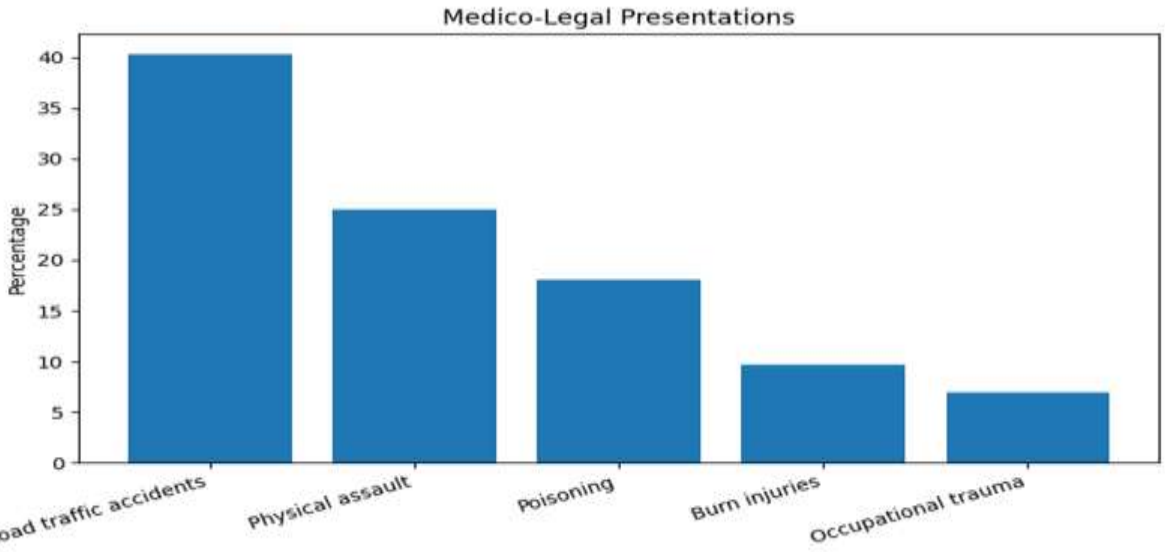
Pediatric morbidity comprised 31.8% (n=197) of total cases. Respiratory tract infections were the predominant pediatric diagnosis, observed in 36.0% of pediatric patients, followed by acute gastroenteritis (24.4%), febrile illnesses (18.8%), malnutrition-related complications (10.1%), and neonatal infections (7.6%). Pediatric admissions were comparatively higher during seasonal infectious outbreaks.



Plastic surgical interventions accounted for 14.2% (n=88) of hospital admissions. Burn injuries were the leading indication for reconstructive procedures, representing 42.0% of plastic surgery cases. Traumatic soft tissue defects accounted for 29.5%, while post-surgical wound reconstruction and chronic non-healing wounds constituted 18.2% and 10.3% of cases, respectively.

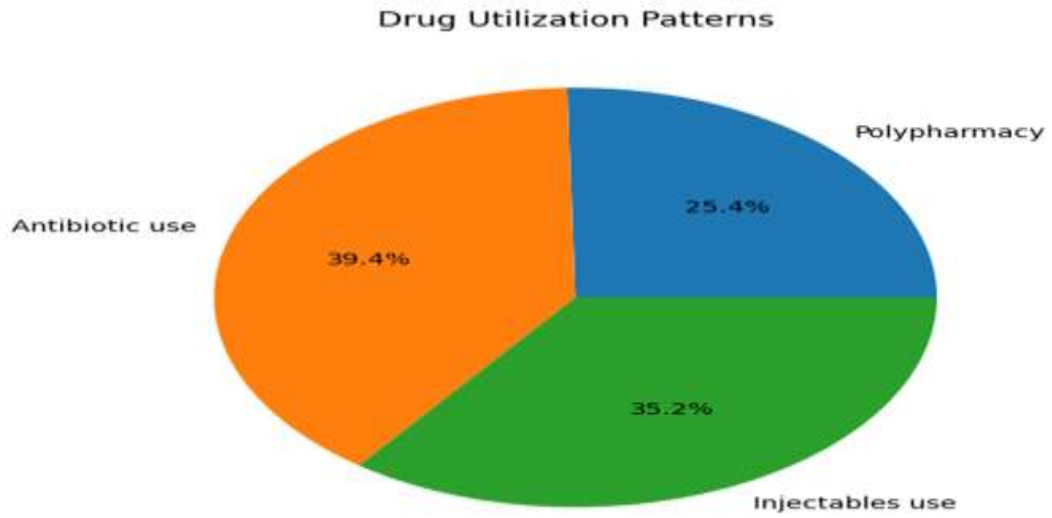


Medico-legal presentations constituted 11.6% (n=72) of the study population. Road traffic accidents were the most frequent medico-legal presentation (40.3%), followed by physical assault (25.0%), poisoning cases (18.1%), burn-related injuries (9.7%), and occupational trauma (6.9%). Most medico-legal cases were managed through emergency services and required multidisciplinary evaluation.



Drug utilization analysis demonstrated substantial prescribing variability across departments. The average number of drugs prescribed per encounter was 4.8 ± 1.9. Polypharmacy, defined as prescription of five or more medications, was observed in 39.4% of patients. Antibiotics were prescribed in 61.2% of clinical encounters, while injectable medications were administered in 54.7% of admissions. Analgesics, proton pump inhibitors, antihypertensive agents, and broad-spectrum antibiotics were among the most commonly prescribed therapeutic classes.

A statistically significant association was identified between prolonged hospital stay and increased medication burden (p=0.01). Patients admitted with burn injuries, severe maternal complications, and major trauma-related medico-legal presentations demonstrated comparatively higher rates of polypharmacy and prolonged hospitalization



DISCUSSION

The present study provides a comprehensive overview of the multidisciplinary clinical burden encountered in a tertiary care hospital by integrating maternal and pediatric morbidity, plastic surgical interventions, medico-legal presentations, and drug utilization patterns within a single healthcare framework. The findings demonstrate the complexity of tertiary healthcare delivery in resource-constrained settings and emphasize the growing need for coordinated multidisciplinary management strategies.

Maternal morbidity accounted for a substantial proportion of hospital admissions, with hypertensive disorders of pregnancy and anemia identified as the most prevalent obstetric complications. These findings are consistent with

previously published international and regional studies reporting hypertensive disorders as a major contributor to maternal morbidity and adverse pregnancy outcomes [1,2]. Maternal anemia remains highly prevalent in developing countries because of nutritional deficiencies, inadequate antenatal care, poor socioeconomic conditions, and delayed healthcare access [3]. The high frequency of these preventable maternal complications observed in the present study indicates the need for strengthened antenatal surveillance, nutritional supplementation programs, and timely referral systems to reduce maternal health risks.

Pediatric morbidity also represented a major clinical burden, particularly respiratory tract infections and acute gastroenteritis. Similar disease patterns have been reported across low- and middle-income countries where infectious diseases remain dominant causes of childhood hospitalization and mortality [4]. Environmental pollution, overcrowding, poor sanitation, limited immunization coverage, and malnutrition are recognized contributors to increased pediatric infectious disease burden [5]. The findings of the present study further support the importance of preventive pediatric healthcare measures, including vaccination campaigns, nutritional interventions, parental education, and infection control practices.

Plastic surgical interventions formed an important component of tertiary care management, with burn injuries representing the leading indication for reconstructive procedures. Previous epidemiological studies have similarly identified burns as a major cause of morbidity in South Asian populations, often resulting in prolonged hospitalization, repeated surgeries, disability, and psychological trauma [6,7]. In addition, the considerable proportion of traumatic soft tissue injuries observed in this study reflects the increasing burden of trauma-related reconstructive needs within emergency surgical services. These findings highlight the importance of specialized burn units, trauma reconstruction services, and multidisciplinary rehabilitation programs in tertiary healthcare institutions.

Medico-legal presentations constituted a notable proportion of emergency admissions, predominantly involving road traffic accidents, physical assault, and poisoning cases. These findings are in agreement with global public health data demonstrating increasing trauma-related morbidity and mortality worldwide, particularly in urban and densely populated regions [8]. Road traffic accidents remain among the leading causes of preventable injury and death globally, contributing substantially to emergency healthcare burden and medico-legal workload [9]. The frequency of assault and poisoning cases additionally reflects underlying social, behavioral, and occupational health challenges that require coordinated preventive strategies involving healthcare professionals, public health authorities, and legal agencies.

Drug utilization analysis revealed high rates of polypharmacy and antibiotic prescribing across different clinical departments. The average number of medications prescribed per encounter exceeded the optimal limits recommended by the World Health Organization prescribing indicators, suggesting potential irrational prescribing trends [10]. Similar findings have been documented in tertiary healthcare settings where critically ill and multisystem patients often require multiple therapeutic agents [11]. However, excessive medication use increases the risk of adverse drug reactions, drug-drug interactions, medication errors, antimicrobial resistance, and healthcare costs.

The high prevalence of antibiotic utilization observed in this study is particularly important because irrational antibiotic prescribing remains a major global health concern. Overuse of broad-spectrum antibiotics contributes significantly to antimicrobial resistance, which has emerged as one of the leading threats to modern healthcare systems [12]. Implementation of antimicrobial stewardship programs, prescription audits, and evidence-based treatment guidelines may therefore improve rational drug use and optimize patient outcomes.

A statistically significant association was observed between prolonged hospitalization and increased medication burden. Patients with severe burns, obstetric complications, and trauma-related conditions required multiple medications and prolonged supportive care, thereby increasing the likelihood of polypharmacy and treatment-related complications. Similar associations have been reported in previous studies evaluating prescribing trends and hospital resource utilization in tertiary healthcare settings [13].

The major strength of the present study lies in its integrated multidisciplinary design, which collectively evaluates diverse clinical domains that are often studied separately. By combining maternal, pediatric, surgical, medico-legal, and pharmacotherapeutic data, the study provides broader insight into the overall healthcare burden encountered in tertiary institutions. Nevertheless, certain limitations should be acknowledged. The single-center design may limit generalizability of findings to other healthcare settings, and the cross-sectional nature of the study does not permit establishment of causal relationships. Furthermore, variations in departmental prescribing practices and seasonal disease trends may have influenced some findings.

Despite these limitations, the study contributes valuable evidence regarding the interconnected clinical challenges faced by tertiary healthcare systems in developing regions. Strengthening multidisciplinary coordination, promoting rational pharmacotherapy, improving trauma prevention programs, and implementing evidence-based healthcare policies may substantially improve patient outcomes and healthcare efficiency.

CONCLUSION

The present study demonstrates that tertiary healthcare institutions manage a highly diverse and interconnected spectrum of maternal morbidity, pediatric illnesses, reconstructive surgical conditions, medico-legal emergencies, and complex pharmacotherapeutic practices. Hypertensive disorders of pregnancy, anemia, respiratory tract infections, burn injuries, and trauma-related medico-legal cases constituted major contributors to hospital burden.

The findings further revealed significant rates of polypharmacy and antibiotic utilization, emphasizing the importance of rational prescribing strategies and antimicrobial stewardship interventions. Prolonged hospitalization was significantly associated with increased medication burden, particularly among patients with severe trauma, burns, and obstetric complications.

Overall, the study highlights the critical need for multidisciplinary healthcare coordination, strengthened clinical surveillance systems, evidence-based prescribing practices, and integrated patient management approaches in tertiary care settings. Future multicenter prospective studies are recommended to further evaluate long-term clinical outcomes, healthcare utilization trends, and the effectiveness of targeted interventions aimed at improving healthcare quality and patient safety.

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