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Research Article

EVALUATION OF DRUG UTILIZATION PATTERNS IN
PREGNANT WOMEN AT A SECONDARY CARE HOSPITAL:
A RETROSPECTIVE OBSERVATIONAL STUDYMohamed Adnan P K¹, Rajapriya M², Ranjith M², Ravindar M², Roja C², Sakthi M²¹Assistant Professor, Department of Pharmacy Practice, Sri Lakshminarayan College of Pharmacy, Dharmapuri District, Tamilnadu - 636809. India.²B. Pharm Final year Student, Department of Pharmacy Practice, Sri Lakshminarayan College of Pharmacy, Dharmapuri District, Tamilnadu - 636809. India.**Abstract:**

Background: Drug utilization research is an essential component of pharmacoepidemiology that evaluates the prescribing, dispensing, and use of medicines in a defined population. Pregnancy is a unique physiological condition requiring cautious medication use because drugs may influence both maternal health and fetal development. Despite the increasing availability of evidence-based guidelines, irrational prescribing and exposure to potentially harmful medications remain concerns in developing countries. Therefore, periodic assessment of prescribing practices is necessary to promote rational drug use and improve maternal and neonatal outcomes. **Objective:** To evaluate the drug utilization pattern, prescribing practices, therapeutic drug classes, routes of administration, and safety profile of medications prescribed to pregnant women attending a secondary care hospital. **Materials and Methods:** A retrospective observational study was conducted in the Department of Obstetrics and Gynaecology of a secondary care hospital over six months. Medical records and prescriptions of 150 pregnant women were reviewed. Data regarding demographic characteristics, gravidity, trimester, maternal illnesses, therapeutic drug classes, routes of administration, and FDA pregnancy risk categories were collected and analyzed using descriptive statistics. **Results:** Among the 150 pregnant women, 44.6% belonged to the 26–30 years age group, while 55.3% were primigravidae. Most women (88%) were in the third trimester. Iron and vitamin deficiency (40%) was the predominant maternal condition. Oral administration represented 58.24% of all medications, followed by intravenous administration (39.24%). Nutritional supplements, antibiotics (17.11%), antiulcer drugs (13.81%), analgesic-antipyretics (11.85%), antihypertensives (8.47%), and antiemetics (8.32%) were the most commonly prescribed medications. Most prescribed drugs belonged to FDA pregnancy Categories A and B. **Conclusion:** The prescribing practices were largely rational and consistent with standard treatment guidelines. Continuous prescription auditing, adherence to evidence-based guidelines, and regular drug utilization studies are essential to ensure safe pharmacotherapy during pregnancy.

Keywords: Drug utilization study, Pregnancy, Prescribing pattern, Rational drug use, FDA pregnancy category, Maternal health, Obstetrics, Pharmacoepidemiology.

Corresponding author:**Dr. Mohamed Adnan P K,**Assistant Professor, Department of Pharmacy Practice,
Sri Lakshminarayan College of Pharmacy, Dharmapuri. Tamilnadu. India.

Mobile:

Email Id- 123adnanashraf12@gmail.com

QR CODE



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INTRODUCTION:

Drug utilization research (DUR) is defined by the World Health Organization (WHO) as the marketing, distribution, prescription, and use of medicines in society with special emphasis on the medical, social, and economic consequences of drug use. Drug utilization studies are important tools for evaluating prescribing behavior, identifying irrational prescribing, promoting evidence-based medicine, and improving healthcare quality.¹ Pregnancy represents a unique physiological state characterized by marked anatomical, hormonal, metabolic, and pharmacokinetic alterations. These physiological changes significantly affect drug absorption, distribution, metabolism, and elimination, making medication selection more complex than in the general population.² Pharmacotherapy during pregnancy should therefore achieve maximum maternal benefit while minimizing fetal exposure to potentially teratogenic drugs. Approximately 80–90% of pregnant women receive at least one medication during pregnancy excluding vitamins and mineral supplements.³ Medications are prescribed for routine antenatal supplementation, management of pregnancy-related symptoms, treatment of chronic diseases such as hypertension and diabetes mellitus, and management of acute infections. However, inappropriate prescribing may expose the fetus to congenital malformations, fetal toxicity, neonatal complications, and adverse pregnancy outcomes. The introduction of the FDA Pregnancy Risk Categories (A, B, C, D, and X) and the more recent Pregnancy and Lactation Labeling Rule (PLLR) has improved medication safety evaluation during pregnancy. Nevertheless, medication safety data remain limited because pregnant women are frequently excluded from clinical trials.⁴ Several international studies have demonstrated considerable variations in prescribing practices during pregnancy depending on healthcare settings, physician awareness, and local treatment guidelines. Studies conducted in India have consistently reported that nutritional supplements, antibiotics, antiemetics, analgesics, and antiulcer drugs constitute the majority of prescribed medications.^{5–8} Drug utilization studies provide valuable information regarding the quality of prescribing practices, adherence to WHO prescribing indicators, compliance with essential medicines lists, and the rational use of medicines. These studies also identify opportunities for improving maternal healthcare through educational interventions and clinical pharmacy services. Therefore, the present study was undertaken to evaluate drug utilization patterns among pregnant women attending a secondary care hospital and to assess the safety profile of prescribed medications according to FDA pregnancy risk categories.

MATERIALS AND METHODS:**Study Design**

Retrospective observational study.

Study Site

Department of Obstetrics and Gynaecology, Secondary Care Hospital, Dharmapuri, Tamil Nadu.

Study Duration

October 2025 to March 2026 (6 months).

Study Population

A total of **150 pregnant women** were included.

Inclusion Criteria

- Pregnant women attending antenatal OPD or admitted to obstetric wards
- All gestational age groups
- Complete medical records

Exclusion Criteria

- Incomplete case records
- Postpartum women
- Illegible prescriptions

Study Variables

The following parameters were evaluated:

- Age
- Gravidity
- Trimester
- Maternal illnesses
- Drug categories
- Route of administration
- FDA pregnancy risk category
- Prescribing pattern

Data Collection

Patient information was collected from hospital case records and prescription sheets using a structured data collection form.

Statistical Analysis

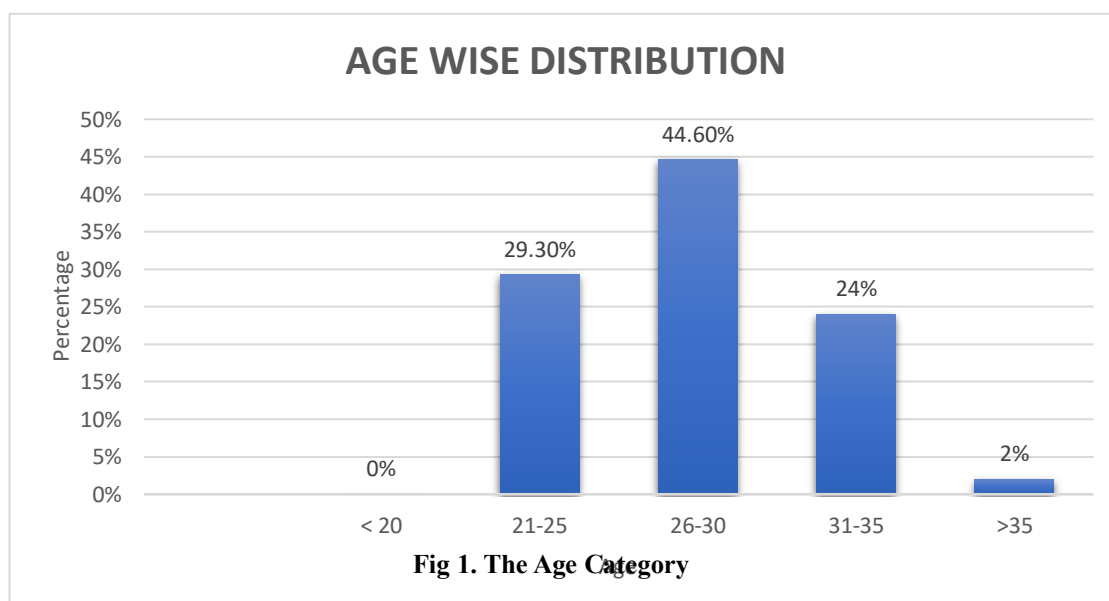
Data were entered into Microsoft Excel and analyzed using descriptive statistics. Continuous variables were expressed as mean $\pm$ SD wherever applicable, while categorical variables were expressed as frequency and percentage.

Ethical Considerations

Institutional Ethics Committee approval was obtained before commencement of the study. Patient confidentiality was maintained by anonymizing all patient identifiers.

Results:**Table 1. The Age Category**

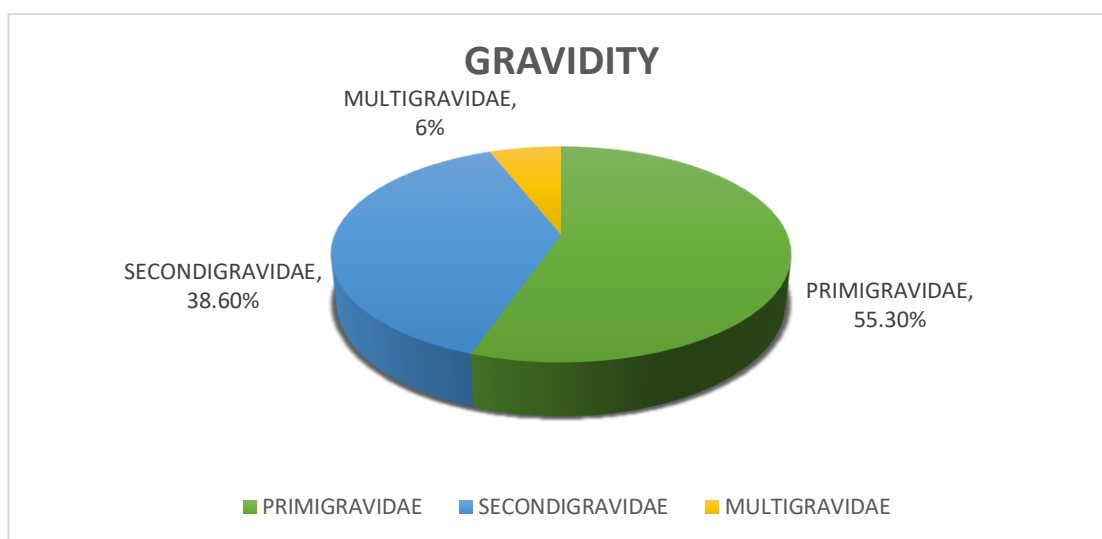
CATEGORY	FREQUENCY	NUMBER
≤ 20	0%	0
21-25	29.30%	44
26-30	44.60%	67
31-35	24%	36
>35	2%	3



The age distribution of the study participants showed that none of the pregnant women were below 20 years of age. Among the participants, 29.3% were in the 21–25 years age group, 44.6% were in the 26–30 years age group, 24.0% were in the 31–35 years age group, and 2.0% were above 35 years of age. The majority of the participants (44.6%) belonged to the 26–30 years age group.

Table 2. Description Of Gravidity

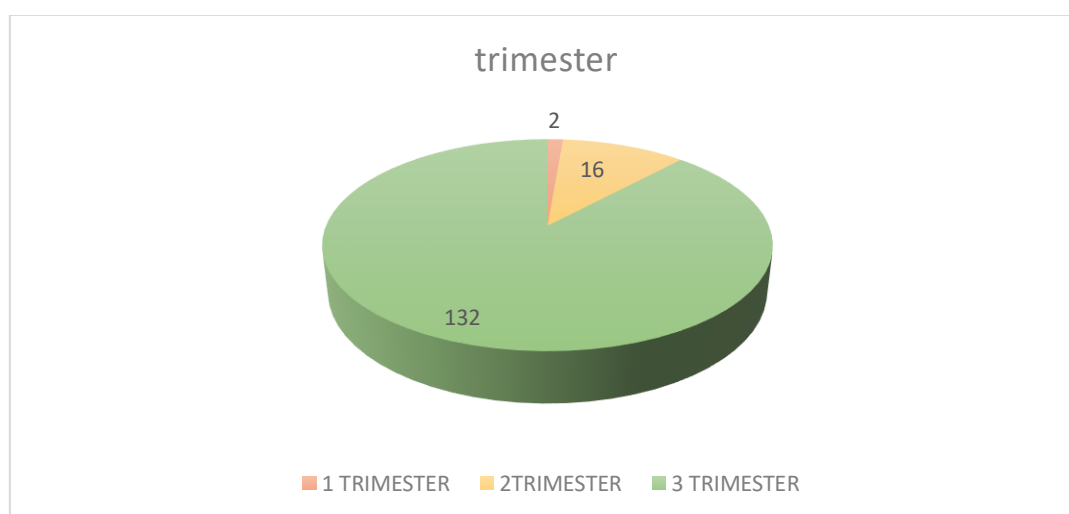
Gravidity	Number	Frequency
Primigravidae	83	55.30%
Secondigravidae	58	38.60%
Multigravidae	9	6%

Fig 2. Description of gravidity

The analysis of gravidity revealed that the majority of the study participants (55.3%) were primigravidae, followed by 38.6% who were second gravidae, while 6.0% were multigravidae. This indicates that first-time pregnancies constituted the largest proportion of the study population.

Table 3. Description Of Trimester

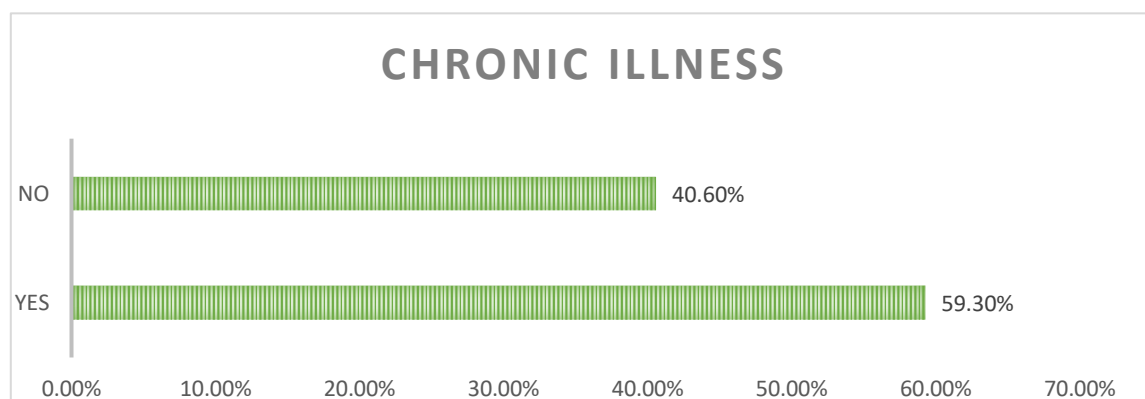
Trimester	Number	Frequency
1 Trimester	2	1.33%
2 Trimester	16	10.60%
3 Trimester	132	88%

Fig 3. Description of Trimester

The analysis of gestational age revealed that 1.33% of the pregnant women were in the first trimester, 10.6% were in the second trimester, and the majority (88.0%) were in the third trimester. This indicates that most prescriptions were issued during the later stages of pregnancy.

Table 4. Description Of Chronic illness

CHRONIC ILLNESS	NUMBER	FREQUENCY
YES	89	59.30%
NO	61	40.60%

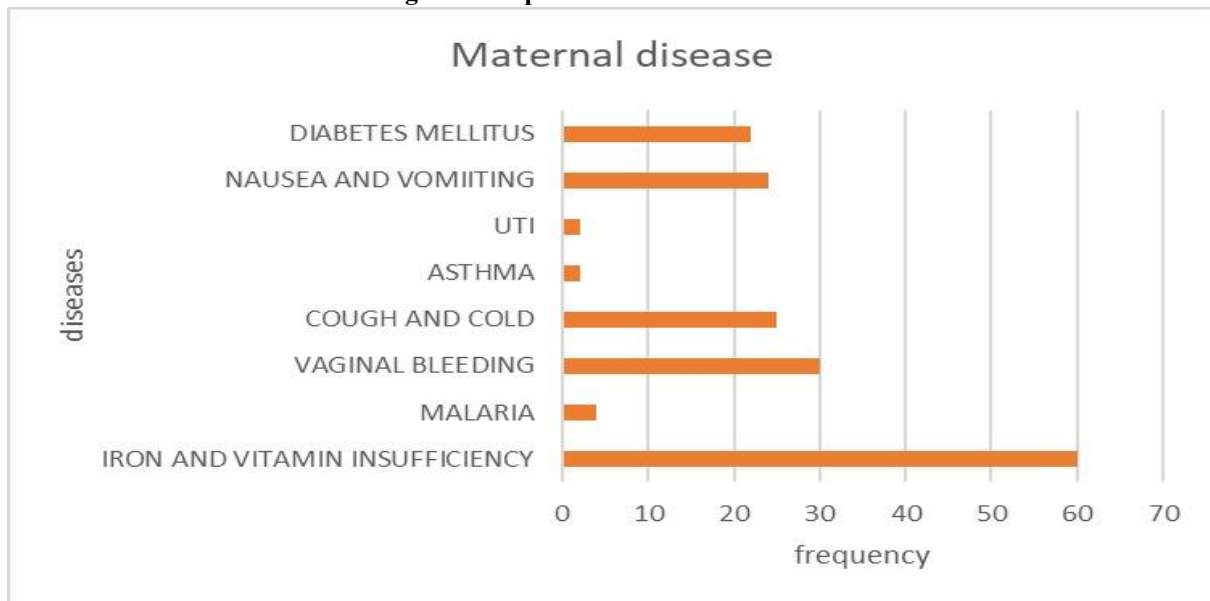
Fig 4. Description of Chronic illness

The data of the patients showed that 40% don't have chronic illnesses, and 59.3% have chronic illnesses.

Table 5. Description Of Maternal disease

MATERNAL DISEASE	FREQUENCY	PERCENTAGE
IRON AND VITAMIN INSUFFICIENCY	60	16.66%
MALARIA	4	2.66%
VAGINAL BLEEDING	30	20%
COUGH AND COLD	25	40%
ASTHMA	2	1.33%
UTI	2	1.33%
NAUSEA AND VOMITTING	24	16%
DIABETES MELLITUS	22	14.60%

Fig 5. Description of Maternal diseases



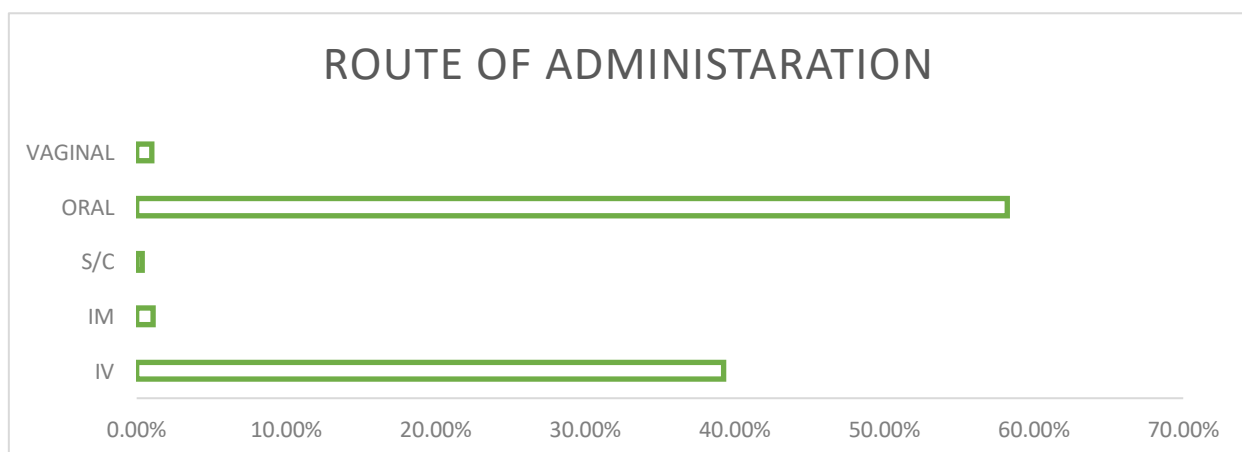
The bar graph illustrates the distribution of maternal illnesses among the 150 pregnant women included in the study. Iron and vitamin deficiency was the most frequently reported condition, affecting 40.0% (60 cases) of the participants. This was followed by vaginal bleeding in 20.0% (30 cases), cough and cold in 16.66% (25 cases), and nausea and vomiting

in 16.0% (24 cases) of the participants. Diabetes mellitus was reported in 14.66% (22 cases) of the study population. In contrast, malaria (2.66%, 4 cases), asthma (1.33%, 2 cases), and urinary tract infection (UTI) (1.33%, 2 cases) were the least commonly reported maternal condition.

Table 6. Description Of Maternal disease

ROUTE OF ADMINISTRATION OF DRUGS	FREQUENCY	PERCENTAGE
IV	500	39.24%
IM	14	1.09%
S/C	5	0.39%
ORAL	742	58.24%
VAGINAL	13	1.02%

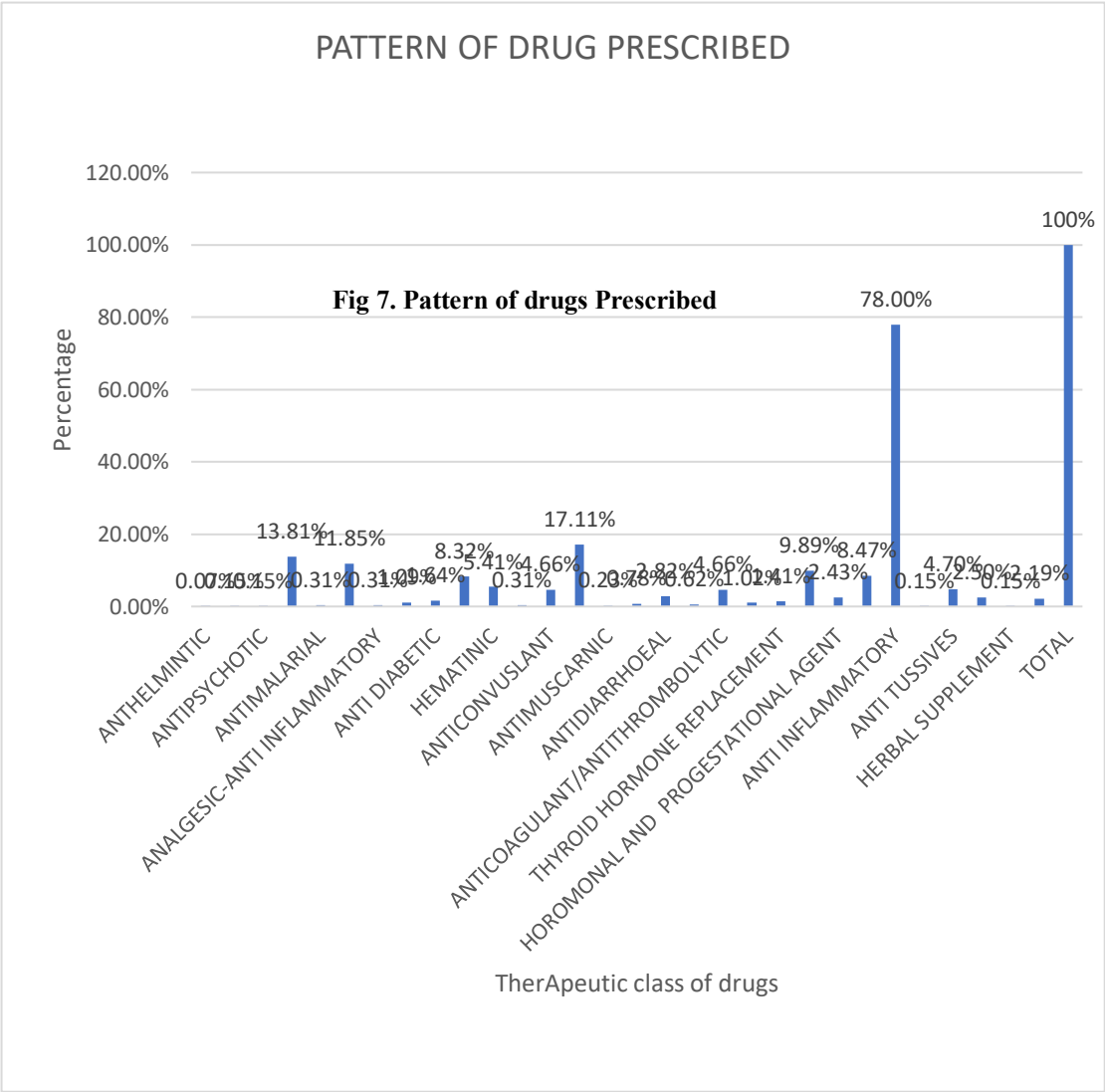
Fig 6. Route Of Administration



The graph illustrates the distribution of drug administration routes among the study population. The oral route was the most frequently used mode of drug administration, accounting for more than 60% of all prescriptions. The intravenous (IV) route was the second most commonly used, representing over 40% of drug administrations. In contrast, the intramuscular (IM) and subcutaneous (SC) routes were used infrequently. The vaginal route was the least commonly employed, indicating that it was reserved for specific clinical indications

Table 7. Pattern of drugs Prescribed

CLASS OF DRUG	PERCENTAGE	FREQUENCY	FDA category
ANTHELMINTIC	0.07%	1	C
ANITDEPRESSION	0.15%	2	C
ANTIPSYCHOTIC	0.15%	2	C
ANTIULCER	13.81%	176	B
ANTIMALARIAL	0.31%	4	C
ANALGESIC-ANTIPYRETIC	11.85%	151	B
ANALGESIC-ANTI INFLAMMATORY	0.31%	4	C
OPIOD ANALGESIC	1.09%	14	C
ANTI DIABETIC	1.64%	21	B
ANTIEMETICS	8.32%	106	A
HEMATINIC	5.41%	69	A
ANTISPASMODIC	0.31%	4	B
ANTICONVULSANT	4.66%	7	D
ANTIBIOTIC	17.11%	218	B
ANTIMUSCARNIC	0.23%	3	C
NSAID	0.78%	10	C
ANTIDIARRHOEAL	2.82%	36	B
ANTI-INFLAMMATORY/IMMUNOSUPPRESSANT	0.62%	8	C
ANTICOAGULANT/ANTITHROMBOLYTIC	4.66%	7	B
ANTIPLATELET	1.02%	13	C
THYROID HORMONE REPLACEMENT	1.41%	18	A
NUTRITIONAL SUPPLEMENT	9.89%	126	A
HOROMONAL AND PROGESTATIONAL AGENT	2.43%	31	B
ANTI HYPERTENSIVE	8.47%	108	B
ANTI INFLAMMATORY	78.00%	10	C
SEDATIVE HYPNOTIC	0.15%	2	D
ANTI TUSSIVES	4.70%	60	C
LAXATIVES	2.50%	33	B
HERBAL SUPPLEMENT	0.15%	2	Not assigned
ANTI FIBRINOLYTICS	2.19%	28	B



The graph illustrates the distribution of drugs prescribed to pregnant women according to their therapeutic class. Nutritional supplements were the most frequently prescribed medications, accounting for 78.0% of all prescriptions, emphasizing the importance of nutritional support during pregnancy. Among the therapeutic agents, antibiotics (17.11%), analgesics/antipyretics (13.81%), and antiemetics (8.32%) were the most commonly prescribed to manage infections, pain, fever, and pregnancy-related nausea and vomiting. Other therapeutic classes were prescribed less frequently. Overall, the prescribing pattern reflects a rational approach, with primary emphasis on nutritional supplementation and the appropriate management of common medical conditions encountered during pregnancy.

SUMMARY:

The present study was conducted to evaluate the drug utilization patterns among pregnant women attending a secondary care hospital in Dharmapuri. Pregnancy is a unique physiological condition in which drug therapy requires careful consideration, as medications may affect both the mother and the developing fetus. Therefore, evaluating prescribing patterns is essential to promote the safe and rational use of medicines during pregnancy.

This retrospective observational study was carried out in the Department of Obstetrics and Gynaecology at Secondary Care Hospital, Dharmapuri, over a period of six months. Data were collected from the prescription records and case files of pregnant women attending the antenatal outpatient department or admitted to the hospital. Demographic characteristics, gravidity, trimester distribution, maternal illnesses, routes of drug administration, therapeutic classes of prescribed medications, and FDA pregnancy risk categories were analysed.

A total of 150 pregnant women were included in the study. The majority of the participants (44.6%) were aged 26–30 years, followed by 29.3% in the 21–25 years age group and 24.0% in the 31–35 years age group. More than half of the participants (55.3%) were primigravidae, indicating that first-time pregnancies constituted the largest proportion of the study population. With respect to gestational age, the majority of women (88.0%) were in the third trimester, whereas only a small proportion were in the first and second trimesters.

Among the maternal health conditions observed, iron and vitamin deficiency was the most common,

affecting 40.0% of the participants. Other frequently reported conditions included vaginal bleeding, cough and cold, nausea and vomiting, and diabetes mellitus. Malaria, asthma, and urinary tract infections were reported in only a few cases. These findings suggest that nutritional deficiencies and common pregnancy-related illnesses are prevalent among pregnant women attending secondary care hospitals.

Analysis of the routes of drug administration revealed that the oral route was the most frequently used (approximately 58%), followed by the intravenous route (approximately 39%). The intramuscular, subcutaneous, and vaginal routes were used infrequently and only when clinically indicated.

Evaluation of the prescribed medications according to their therapeutic class showed that nutritional supplements constituted the largest proportion of prescriptions, reflecting the importance of nutritional support during pregnancy. Among the therapeutic agents, antibiotics (17.11%), antiulcer drugs (13.81%), analgesics and antipyretics (11.85%), antihypertensive drugs (8.47%), and antiemetics (8.32%) were the most commonly prescribed. Analysis of drug safety demonstrated that the majority of medications belonged to FDA pregnancy risk Categories A and B, indicating that relatively safe drugs were predominantly prescribed during pregnancy. Only a limited number of Category C and D drugs were prescribed, and these were used only when the expected maternal benefits outweighed the potential fetal risks.

Overall, the findings of the present study indicate that the prescribing practices at the study hospital were largely rational and consistent with the principles of safe medication use during pregnancy. The emphasis on nutritional supplementation and the preferential use of medications with favourable safety profiles demonstrates adherence to evidence-based prescribing practices aimed at optimizing maternal and fetal outcomes.

CONCLUSION:

The present study provides valuable insights into the drug utilization patterns among pregnant women attending a secondary care hospital. The findings revealed that the majority of the study participants were aged 26–30 years, were primigravidae, and were in the third trimester of pregnancy, indicating that most prescriptions were issued during the later stages of gestation. Iron and vitamin deficiency was identified as the most common maternal health

condition, emphasizing the importance of nutritional supplementation during pregnancy. Consequently, nutritional supplements constituted the largest proportion of prescribed medications, followed by antibiotics, antiulcer drugs, analgesics and antipyretics, antihypertensive drugs, and antiemetics for the management of pregnancy-related conditions and associated comorbidities. The oral route was the most frequently used mode of drug administration, followed by the intravenous route, while other routes were used only when clinically indicated. Analysis of drug safety demonstrated that the majority of prescribed medications belonged to FDA pregnancy risk Categories A and B, indicating that relatively safe medications were preferentially prescribed during pregnancy. Only a limited number of Category C and D drugs were prescribed, and these were used only when the expected maternal benefits outweighed the potential fetal risks. Overall, the prescribing practices observed in the present study were rational and consistent with standard treatment guidelines for medication use during pregnancy. Regular monitoring of drug utilization patterns, adherence to evidence-based prescribing guidelines, and continuous education of healthcare professionals are essential to further improve the safe and rational use of medicines during pregnancy. Such drug utilization studies provide valuable evidence for optimizing prescribing practices, strengthening maternal healthcare services, and improving health outcomes for both the mother and the fetus.

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