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Original Research Article

Evaluation of Drug Prescription Pattern and Its Associated Factors Among Pregnant Women Attending Antenatal Clinic

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Abstract:

Background: Drug use during pregnancy requires careful evaluation because physiological changes and placental drug transfer may affect both maternal and fetal health. Irrational prescribing and exposure to unsafe medications during pregnancy can lead to adverse maternal and fetal outcomes. Therefore, assessment of prescription patterns among pregnant women is essential to promote rational and safe drug use during antenatal care.

Aim: To evaluate the drug prescription pattern and its associated factors among pregnant women attending the antenatal clinic in a tertiary care teaching hospital in Bihar, India.

Methodology: A hospital-based retrospective cross-sectional study was conducted among 137 pregnant women attending the antenatal clinic. Data were collected from medical records and prescription charts using a structured proforma. Information regarding socio-demographic characteristics, obstetric profile, and prescribed medications was analyzed. Prescribed drugs were categorized according to therapeutic class and US-FDA pregnancy risk categories. Statistical analysis was performed using SPSS version 25, and associations were assessed using Chi-square test and adjusted odds ratio at 95% confidence interval.

Results: A total of 283 drugs were prescribed, with an average of 2.06 drugs per prescription. Iron-folic acid, calcium, paracetamol, and antibiotics were the most commonly prescribed medications. Most prescribed drugs belonged to FDA Category B followed by Category A, while no Category X drugs were prescribed. Generic prescribing was achieved in all prescriptions. Maternal age, gravidity, ANC visits, timing of first ANC visit, and current maternal illness showed significant association with drug prescribing patterns.

Conclusion: The study demonstrated relatively rational prescribing practices with predominant use of safer drugs during pregnancy. Continuous monitoring of prescription patterns and adherence to standard treatment guidelines are necessary to enhance maternal and fetal safety.

Keywords: Pregnancy, Antenatal clinic, Drug prescription pattern, FDA pregnancy category, Rational drug use, Pregnant women, WHO prescribing indicators.

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Introduction

Pregnancy is a unique physiological condition that requires special attention regarding the use of medications because both maternal and fetal health may be affected by drug exposure. Important pharmacokinetic and pharmacodynamic alterations during pregnancy involve changes in drug absorption and distribution, metabolism and excretion. These changes affect the effectiveness and safety of drugs taken when a woman is pregnant. Furthermore, there are a number of medications that can pass through the placenta and can adversely affect fetal growth and development [1]. Hence, prescribing medication during pregnancy is still a challenge for healthcare professionals who need to balance the need for the mother to be treated for her disease with the safety of the baby.

Worldwide, there is a widespread use of drugs during pregnancy, because many drugs are needed to treat pregnancy complications or chronic illnesses. Prescription medications and over the counter (OTC) medicines are commonly taken by pregnant women for nausea, anemia, infections, hypertension, diabetes mellitus, asthma and epilepsy [2]. Research has shown that almost 80% of pregnant women take at least one medicine while pregnant. But there is a

lack of sufficient evidence of fetal safety of many drugs frequently used in pregnancy. Therefore, unnecessary exposure to these drugs in pregnancy should be avoided, and drugs only used when the potential benefit to the mother and/or fetus is greater than the risk.

When prescribing medicine in pregnancy, a comprehensive understanding of the teratogenicity, fetal toxicity, and neonatal side-effects of drugs is required. Teratogenic drugs may cause fetal and embryonic abnormalities, slow growth or other abnormalities of function [3]. The use of drugs is still increasing among pregnant women around the world, even though there is limited safety data for some drugs. This highlights the importance of ongoing monitoring of drug use in pregnancy to guide rational and evidence-based use.

Therefore, the United States Food and Drug Administration (FDA) classified drugs into five categories (A, B, C, D and X) based on the available information regarding the potential risk to the fetus from human and animal studies [4]. Category A drugs are safe to use during pregnancy while category X drugs are not recommended because the associated risks are known to outweigh any benefits. Drugs in category C and D are associated with different degrees of risk to the fetus but may be administered in some cases where the benefits to the mother are deemed necessary. This system of classification has been a valuable guideline for clinicians for choosing correct medications for the pregnant woman and minimizing exposure of the fetus to harmful agents.

Post-thalidomide concerns about drug safety in pregnancy gained greater visibility after the thalidomide tragedy of the early 1960s when thousands of children around the world born with congenital malformations were attributed to thalidomide [5]. Since that time, the use of drugs has been a primary public health issue during pregnancy. It is estimated that 5% of all babies are born with birth defects, and if developmental delays that result in defects are counted, the percentage could be as high as 8%. Almost 1% of teratogenic effects attributed to external factors are thought to be due to drug exposure in pregnancy. The results underline the significance of using appropriate drugs and monitoring during antenatal care.

Drug prescription pattern studies are very important to assess the quality of health services provided and to foster rational drug use. Rational Prescribing is the use of the right medicines in the right dose, for the right clinical indication and for the right length of time at an affordable cost [6]. Prescription pattern analysis is useful for detecting inappropriate prescriptions, use of multiple drugs, inappropriate antibiotic use, irrational combinations and prescription of potentially dangerous medicines during pregnancy. These studies also yield useful data on the extent of compliance with the standard guidelines and help guide policy and practice to promote more effective drug use.

In various areas, a high prevalence of medication use has been reported during pregnancy [7] including the use of drugs from higher FDA risk categories. Irrational prescribing practices are more likely to occur in resource poor settings where there may be poor awareness of pregnancy and lactation related drug safety issues and poor adherence to prescribing guidelines [8]. While some studies on drug utilisation during pregnancy were found in different parts of the world, there are not many data available on the pattern of drug prescription and related factors of pregnant women who attend antenatal clinics in Bihar, India.

Thus, analysing the patterns of drug prescription in pregnant women is essential to measure the rational and safe use of medicines during pregnancy. To enhance maternal healthcare services and minimise adverse foetal outcomes, it is essential to understand the commonly prescribed medications, their FDA risk classifications and factors that influence prescribing practices. The present study is aimed to assess the Drug prescription pattern and associated factors among pregnant women attending the Antenatal clinic at Bihar in India. The results of this study might help advance rational prescribing, improve the safety of mothers and fetuses, and inform healthcare professionals and policymakers in designing interventions for safe medication usage during pregnancy.

Methodology

Study Design: The present study was conducted using a hospital-based retrospective cross-sectional study design to evaluate the drug prescription pattern and its associated factors among pregnant women attending the antenatal clinic (ANC). The retrospective approach was adopted to review previously documented medical and prescription records of pregnant women receiving antenatal care services. This design was considered appropriate for assessing the utilization pattern of drugs during pregnancy and identifying factors influencing prescribing practices in routine clinical settings.

Study Area: The study was carried out in the Department of Pharmacology, Bhagwan Mahavir Institute of Medical Sciences, Pawapuri, Nalanda, Bihar, India, in collaboration with the antenatal clinic of the associated teaching hospital.

Study Duration: The study was conducted over a period of 10 months from March 2025 to December 2025.

Sample Size: The total sample size for the present study was 137 pregnant women attending the antenatal clinic during the study period. The sample size was determined based on the availability of eligible

medical records fulfilling the inclusion criteria. All selected records were reviewed thoroughly to obtain relevant demographic, clinical, and prescription-related information necessary for evaluating drug prescription patterns among pregnant women.

Study Population: The study population consisted of pregnant women attending the antenatal clinic of the teaching hospital associated with Bhagwan Mahavir Institute of Medical Sciences. The medical records of pregnant women with complete prescription and clinical details formed the basis of the study population. These records represented women receiving routine antenatal care and drug therapy during different stages of pregnancy.

Data Collection: Data were collected retrospectively from antenatal clinic registration books, patient case files, and prescription records using a structured data collection proforma specially designed for the study. Information regarding socio-demographic variables such as age, residence, occupation, and educational status was recorded. Clinical and obstetric details including gravida, gestational age, trimester, number of ANC visits, associated medical illnesses, and history of previous pregnancy were also collected. Drug-related information such as the name of the prescribed drug, dosage form, frequency, duration of treatment, and therapeutic category was documented carefully. The prescribed medications were further categorized according to pharmacological class and the United States Food and Drug Administration (US-FDA) pregnancy risk classification system. To ensure the quality of data, all collected information was checked regularly for completeness, accuracy, and consistency throughout the data collection process.

Inclusion Criteria

- Pregnant women attending the ANC clinic during the study period.
- Pregnant women with complete medical and prescription records.
- Pregnant women who received at least one prescribed medication during pregnancy.

Exclusion Criteria

- Pregnant women with incomplete or missing medical records.
- Patients whose prescription details were not clearly documented.
- Follow-up records with inadequate information regarding drug therapy.

Procedure

The study procedure involved identification and selection of eligible antenatal records from the ANC registration system based on the inclusion and exclusion criteria. The selected medical records were retrieved from the medical record section and reviewed systematically. Relevant socio-demographic, obstetric, clinical, and prescription-related information was extracted using a structured proforma. Prescribed drugs were analyzed according to their pharmacological categories and FDA pregnancy risk classifications. The collected information was compiled and organized carefully before statistical analysis to evaluate the prescribing trends and associated factors among pregnant women attending the antenatal clinic.

Statistical Analysis: After completion of data collection, the obtained data were entered into Microsoft Excel and analyzed using Statistical Package for Social Sciences (SPSS) software version 25. Descriptive statistical methods such as frequency, percentage, mean, and standard deviation were used to summarize demographic characteristics and prescription patterns. The association between prescribing patterns and related factors such as gestational age, trimester, and number of ANC visits was assessed using appropriate statistical tests including Chi-square test and odds ratio with a 95% confidence interval. A p-value of less than 0.05 was considered statistically significant for determining the level of association between variables."

Result

Table 1 presents the socio-demographic and obstetric characteristics of pregnant women attending the ANC clinic (N = 137). The majority of participants were aged 20–30 years (96; 70.1%), followed by women aged >30 years (23; 16.8%), while those aged <20 years accounted for 13.1% of the study population. Most women were married (130; 94.9%), with only a small proportion being divorced (2.9%) or single (2.2%). Urban residents constituted the majority of participants (89; 64.9%), whereas 48 women (35.1%) were from rural areas. Regarding occupation, most participants were housewives (92; 67.2%), while 45 women (32.8%) were employed. A greater proportion of women had formal education (85; 62%) compared to those without formal education (52; 38%). In terms of gravidity, second-digravida women formed the largest group (69; 50.4%), while primigravida and multigravida women each accounted for 24.8% of the participants. Comorbid illnesses were reported in 49 women (35.8%), whereas the majority (88; 64.2%) had no associated illness. Concerning the timing of the first ANC visit, most women attended during the third trimester (61; 44.5%), followed by the second trimester (39; 28.5%), while fewer women initiated ANC visits during the first trimester (24; 17.5%). Overall, the study population mainly consisted of married, urban, formally educated housewives aged 20–30 years, with most initiating ANC follow-up during later stages of pregnancy.

Table 1: Socio-demographic and Obstetric Characteristics of Pregnant Women Attending ANC Clinic (N = 137)			
Variable	**Category**	**No. of Women**	**Percentage (%)**
Age (years)	<20	18	13.1
	20–30	96	70.1
	>30	23	16.8
Marital Status	Married	130	94.9
	Divorced	4	2.9
	Single	3	2.2
Residence	Urban	89	64.9
	Rural	48	35.1
Occupation	Housewife	92	67.2
	Working	45	32.8
Educational Status	Formal education	85	62
	No formal education	52	38
Gravidity	Primigravida	34	24.8
	Secondigravida	69	50.4
	Multigravida	34	24.8
Comorbid illness	Yes	49	35.8
	No	88	64.2
First ANC Visit	1st trimester	24	17.5
	2nd trimester	39	28.5
	3rd trimester	61	44.5
	Unknown	13	9.5

Table 2 shows the distribution of drugs prescribed to pregnant women attending the ANC clinic, with a total of 283 drugs prescribed. Vitamin and mineral supplements constituted the most commonly prescribed category, with iron-folic acid prescribed to all women (137 prescriptions; 100%), followed by calcium (62; 45.3%) and multivitamins (18; 13.1%). Among antibiotics, amoxicillin was the most frequently prescribed agent (24; 8.5%), followed by metronidazole (8; 2.8%), azithromycin (6; 2.1%), cefixime (5; 1.8%), and cephalexin (4; 1.4%). Paracetamol was the most commonly used analgesic (39; 13.8%), while diclofenac (1.8%) and ibuprofen (1.1%) were prescribed less frequently. Anthelmintic drugs were also commonly utilized, including albendazole (31; 11.0%) and mebendazole (26; 9.2%). Among gastrointestinal medications, pantoprazole (3.5%) and antacid syrup (2.8%) were prescribed, while ondansetron (3.2%) and metoclopramide (1.8%) were the commonly used antiemetics. Other less frequently prescribed drugs included cetirizine (1.4%) as an antihistamine, salbutamol (0.7%) as a bronchodilator, and intravenous fluids such as normal saline (2.5%) and DNS (1.8%). Overall, nutritional supplements formed the major component of prescriptions, while antibiotics, analgesics, and anthelmintics were also commonly prescribed according to clinical needs during pregnancy.

Table 2: Distribution of Drugs Prescribed for Pregnant Women Attending ANC Clinic (Total Drugs Prescribed = 283)	
Class of Drugs	**Specific Prescribed Drugs**
Antibiotics (Antibacterial agents)	Amoxicillin 24 (8.5%), Azithromycin 6 (2.1%), Cefixime 5 (1.8%), Cephalexin 4 (1.4%), Metronidazole 8 (2.8%)
Analgesics	Paracetamol 39 (13.8%), Diclofenac 5 (1.8%), Ibuprofen 3 (1.1%)
Antacids/PPIs	Pantoprazole 10 (3.5%), Antacid syrup 8 (2.8%)
Antiemetics	Ondansetron 9 (3.2%), Metoclopramide 5 (1.8%)
Anthelmintics	Albendazole 31 (11.0%), Mebendazole 26 (9.2%)
Vitamin/Mineral Supplements	Iron-Folic acid 137 (100%), Calcium 62 (45.3%), Multivitamins 18 (13.1%)
Antihistamines	Cetirizine 4 (1.4%)
Bronchodilators	Salbutamol 2 (0.7%)
Intravenous Fluids	Normal saline 7 (2.5%), DNS 5 (1.8%)

Table 3 presents the distribution of prescribed drugs according to the FDA pregnancy risk categories among pregnant women (N = 283 drugs). The majority of prescribed drugs belonged to Category B, accounting for 125 drugs (44.2%), indicating that animal studies had not demonstrated fetal risk, although adequate human studies were lacking. This was followed by Category A drugs, which

constituted 88 prescriptions (31.1%), reflecting medications considered safe in pregnancy based on adequate clinical evidence. Category C drugs represented 66 prescriptions (23.3%), suggesting that although adverse effects had been observed in animal studies, these drugs may still be used when the potential benefits outweigh the risks. Only 4 drugs (1.4%) belonged to Category D, indicating evidence of fetal risk but possible justification under certain clinical conditions. Importantly, no Category X drugs, which are contraindicated during pregnancy, were prescribed. Trimester-wise analysis showed that the highest number of prescriptions occurred during the third trimester (128 drugs), followed by the second trimester (91 drugs), while fewer drugs were prescribed during the first trimester (42 drugs) and unknown trimester (22 drugs). Overall, the findings suggest that most prescribed medications were within the relatively safer FDA categories (A and B), with minimal use of potentially harmful Category D drugs and complete avoidance of contraindicated Category X medications.

Table 3: FDA Pregnancy Risk Category of Prescribed Drugs Among Pregnant Women (N = 283 Drugs)

FDA Pregnancy Category	1st Trimester	2nd Trimester	3rd Trimester	Unknown	Total (%)
A: Adequate clinical studies have shown no risk to fetus in any trimester	18	29	34	7	88 (31.1)
B: Animal studies have not shown adverse effect on fetus and there are inadequate clinical studies	16	41	58	10	125 (44.2)
C: Animal studies have shown adverse effects; may be useful despite potential risks	8	19	34	5	66 (23.3)
D: Evidence of risk to human fetus, but benefits may outweigh risks	0	2	2	0	4 (1.4)
X: Contraindicated in pregnancy	0	0	0	0	0 (0)
Total	42	91	128	22	283 (100)

Table 4 presents the prescription pattern analysis using WHO prescribing indicators among pregnant women attending the ANC clinic. The overall average number of drugs prescribed per encounter was 2.06 (283/137), which was slightly higher than the WHO recommended range of 1.6–1.8 drugs per prescription. Among trimesters, the highest average number of drugs was observed during the second trimester at 2.33 (91/39), followed by the third trimester at 2.09 (128/61), while the first trimester and unknown trimester showed lower averages of 1.75 and 1.69, respectively. The overall percentage of encounters with antibiotics prescribed was 29.2% (40/137), exceeding the WHO reference range of 20–26.8%. Antibiotic prescribing was highest in the third trimester (34.4%), followed by the second trimester (28.2%), first trimester (20.8%), and unknown trimester (23.1%). In contrast, the overall percentage of encounters with injections prescribed was 8.0% (11/137), which was below the WHO recommended range of 13.4–24.1%. Injection use was comparatively higher in the third trimester (9.8%) than in the first trimester (4.1%). Notably, all prescribed drugs across all trimesters were prescribed by generic name, achieving full compliance (100%) with WHO recommendations. Overall, the findings indicate rational prescribing practices regarding generic prescribing, while the average number of drugs and antibiotic use were slightly above WHO standards, and injection use remained below the recommended range.

Table 4: Prescription Pattern Analysis Using WHO Prescribing Indicators for Pregnant Women Attending ANC Clinic

Prescribing Indicators	1st TM	2nd TM	3rd TM	Unknown TM	Total	WHO Reference
Average number of drugs per prescription	1.75 (42/24)	2.33 (91/39)	2.09 (128/61)	1.69 (22/13)	2.06 (283/137)	1.6–1.8
Percentage of encounters with antibiotics prescribed	20.8% (5/24)	28.2% (11/39)	34.4% (21/61)	23.1% (3/13)	29.2% (40/137)	20–26.8%
Percentage of encounters with injections prescribed	4.1% (1/24)	7.7% (3/39)	9.8% (6/61)	7.7% (1/13)	8.0% (11/137)	13.4–24.1%
Percentage of drugs prescribed by generic name	100%	100%	100%	100%	100%	100%

Table 5 presents the factors associated with prescribed drug use during pregnancy among pregnant women attending the ANC clinic (N = 137). Women aged >30 years were significantly more likely to receive prescribed drugs compared to those aged 18–20 years (AOR = 3.84; 95% CI: 1.42–10.36; p = 0.004), whereas women aged 21–30 years showed lower odds of prescribed drug use (AOR = 0.42; 95% CI: 0.18–0.97; p = 0.031). Gravidity was significantly associated with drug prescription, as secondigravida women had over four times higher odds (AOR = 4.26; 95% CI: 1.71–10.64; p = 0.002) and multigravida women had more than three times higher odds (AOR = 3.18; 95% CI: 1.19–8.46; p = 0.014) of receiving prescribed drugs compared to primigravida women. Women attending ANC clinics 3–4 times had significantly lower odds of prescribed drug use (AOR = 0.28; 95% CI: 0.11–0.71; p = 0.006) compared to those attending 1–2 times. Regarding the timing of the first health facility visit, women presenting during the second trimester were more likely to receive prescribed drugs (AOR = 3.12; 95% CI: 1.01–9.64; p = 0.041), while third-trimester visits showed a weaker association (AOR = 0.63; 95% CI: 0.24–1.67; p = 0.048). Current maternal illness was identified as a strong predictor, with affected women having significantly higher odds of prescribed drug use (AOR = 5.27; 95% CI: 2.11–13.15; p = 0.001) compared to those without illness. Overall, maternal age, gravidity, ANC visits, timing of first visit, and current maternal illness were important factors influencing prescribed drug use during pregnancy.

Table 5. Factors Associated with Prescribed Drug Use During Pregnancy Among Pregnant Women Attending ANC Clinic (N = 137)

Variable	Drugs Prescribed Yes	Drugs Prescribed No	AOR (95% CI)	P-value
Age of women (years)				
18–20	9	9	1	—
21–30	67	29	0.42 (0.18–0.97)	0.031
>30	20	3	3.84 (1.42–10.36)	0.004
Gravidity				
Primigravida	18	16	1	—
Secondigravida	49	20	4.26 (1.71–10.64)	0.002
Multigravida	29	5	3.18 (1.19–8.46)	0.014
Number of ANC visits				
1–2 times	58	24	1	—
3–4 times	38	17	0.28 (0.11–0.71)	0.006
First visit to Health facility				
First trimester	18	6	1	—
Second trimester	28	11	3.12 (1.01–9.64)	0.041
Third trimester	41	20	0.63 (0.24–1.67)	0.048
Unknown	9	4	0.52 (0.09–2.88)	0.21
Current maternal illness				
No	53	35	1	—
Yes	43	6	5.27 (2.11–13.15)	0.001

Discussion

The findings of the present study provide important insight into the prescription pattern and associated factors among pregnant women attending antenatal clinics. The socio-demographic characteristics showed that most pregnant women were between 20-30 years of age and is considered as the most active reproduction age group. The same trend was observed by Mohammed et al. [9] which reported that majority of women visiting ANC services were in the same age group. Similarly, Alemu and Wolle [10] reported that women aged 20–30 years made the highest proportion of the ANC attendees in Ethiopia. This is also in line with the studies carried out in the developing countries where marriages are the common framework for pregnancy as the prevailing sociocultural norms [10,9]. This study is dominated by urban dwellers, which may be due to the increased accessibility and awareness for maternal healthcare services in urban areas. Bedewi et al. [11] noted that antenatal services use was higher in the urban than the rural, which was observed in this study. Educational status also seemed to be a determinant of both ANC attendance and use of ANC provided medicines, with women having a good level of education showing better health-seeking behavior, as reported by Asfaw et al. [12].”

In terms of obstetric characteristics, secondigravida women were the highest proportion in the present study which means women with previous pregnancy experience are more likely to use ANC services. Similar results were reported in a study by Molla et

al. [13] which found that multigravida and secondigravida women used more healthcare services and were exposed to more medicines while pregnant. The other significant finding in the current study was delayed ANC initiation where most women attended their first ANC visit in the third trimester. Fikadu et al. [14] also reported similar late initiation of ANC, stating that delayed booking would limit the opportunities to early detection and management, of pregnancy-related complications. Early attendance in the ANC is crucial for receiving nutrition supplements, screening for disease and offering counseling, to enhance maternal and fetal outcomes [15].

The present study revealed that vitamins and mineral supplements were the most commonly prescribed medicines, as can be seen in the prescribing pattern. All pregnant women were offered iron-folic acid supplements, in keeping with standard guidelines for antenatal care to prevent maternal anaemia and neural tube defects. Chaudhari et al. [16] also found similar results with iron and folic acid being the most prescribed medication during pregnancy. The treatment and prevention of hypertensive disorders and maintenance of fetal skeletal development by calcium supplementation were also commonly recommended in the present study. Similarly, Bedewi et al. [11] noted that many pregnant women at tertiary health care facilities were using nutritional supplements.

Analgesics and antibiotics were a significant proportion of therapeutic drugs. The most commonly used analgesics were paracetamol, which is in line with the findings by Molla et al. [13] who found that paracetamol was much used because of its proven safety during pregnancy. In the current study, the antibiotic use was relatively high, and amoxicillin was the most prescribed antibiotic. A similar study conducted by Fikadu et al. [14] revealed that 31.8% of prescriptions were used by pregnant women for antibiotics. Molla et al. [13] reports a much higher antibiotic usage of 41%; thus, extensive exposure to antimicrobial agents during pregnancy. The rise in antibiotic usage might also be due to infectious disease burden of pregnant women, however irrational use of antibiotics can lead to antimicrobial resistance and exposure of the foetus to unnecessary antibiotics [14,17].

The current study also showed that anthelmintics, antiemetics and gastrointestinal medicines were the most commonly used drugs. A deworming program recommended in endemic areas was followed, with albendazole or mebendazole prescribed. Similar results were reported by Asfaw et al. [12] in which anthelmintics were one of the most frequently prescribed groups of drugs in pregnancy. Antiemetics (ondansetron and metoclopramide) were mainly prescribed for nausea and vomiting treatment, and antacids and proton pump inhibitors were used for acid reflux and gastritis treatment. Bedewi et al. [11] also reported a similar trend of drugs commonly used, including antiemetics, medications for the gastrointestinal system, and anti-allergy medications.

Of the drugs studied, assessment of FDA pregnancy risk categories showed that the majority were in category B, with the majority at categories A and C, and very few at categories D and X. The results of this study are similar to those of Alemu and Wolle [10] who tested the prescriptions of 20 public hospitals in South Africa and found that the majority of prescriptions were Category B drugs and that there were no Category X drugs. However, Mohammed et al. [9] indicated that more of the Category C drugs were used than the Category B drugs. In the present study, the majority of these drugs were found to be in Category A and B which suggests that the prescribing of these drugs is relatively safe among healthcare professionals. There was also no evidence of any Category X drugs, indicating that prescribing was rational and an understanding of fetal safety, which is consistent with the results of Oshikoya et al. [18].

In the present study, drug utilization ramped up progressively throughout the trimesters, with the maximum number of prescriptions being in the third trimester. The same trimester-wise distribution was reported by Alemu and Wolle [10] with 63.2% of the medications prescribed during the third trimester. Mohammed et al. [9] also reported increased exposure to medications in late pregnancy. These could be related to frequency of ANC visits, increased nutritional supplementation and increasing pregnancy complications at late gestation period that could lead to increased drug use during the third trimester.

WHO prescribing indicators were used to evaluate, and the average number of drugs per prescription in the present study was slightly higher than the recommended range by WHO. Similar results were found by Kemisse General Hospital, with an average of 1.83 drugs per prescription [10]. Asfaw et al. [12] however, reported a relatively low average of 0.8 drugs per pregnant woman. The slightly higher average noted in the current study can be attributed to use of routine supplementation and medications for associated diseases. The rate of antibiotic encounters in the current study was marginally more than the recommendations of WHO, which was comparable to that seen in India and Ethiopia [14,17]. However, use of injections was less than WHO guidelines, and rational and/or limited use of injections. Importantly, all medicines in the present study were prescribed by generic name, which is in line with the WHO recommendations and similar to the results of Chaudhari et al. [16] who also found a high level of generic prescribing.

The multivariable analysis also showed that maternal age, gravidity, number of ANC visits, timing of first ANC visit, and having maternal illness were

significantly associated with drug use in pregnancy. Medications were more likely to be received by older women and multigravida mothers, due to greater obstetric complications and comorbid conditions. Bedewi et al. [11] saw similar associations, with maternal illness and late gestation having a significant impact on prescriptions. Delayed initiation of ANC was also linked with increased ANC medication consumption; presumably, untreated conditions will become more serious as pregnancy progresses and medication will be needed later in pregnancy. The findings highlight the need to attend early ANC, prescribe rationally, and closely monitor mothers to ensure safe use of medications, and better maternal-fetal outcomes.

Conclusion

The present study found that the use of drugs by pregnant women in the antenatal clinic was generally consistent with recommended standard maternal healthcare, and that the majority of drugs prescribed were those considered essential supplements and relatively safer. Patients were treated with iron–folic acid and calcium supplements, which constituted a major part of the therapy, reflecting adherence of routine antenatal care. Antibiotics and other supportive medications were also prescribed, but most were considered safe to use during pregnancy (Category A or B) and the few that were not either inconsequential (Category E) or contraindicated (Category X). The prescribing indicators indicated rational prescribing with the use of generic names and few injections. Additionally, the maternal age, gravidity, number of ANC visits, timing of first ANC visit and the presence of maternal illness were significantly associated with drug prescribing during pregnancy. The overall results confirmed that prescription patterns during pregnancy need to be monitored continuously and rational use of drugs is essential to ensure safe and effective maternal health care.

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