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A RETROSPECTIVE STUDY ON DRUG UTILIZATION IN PEDIATRIC PATIENTS

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Abstract:

Understanding the drug use habits of pediatric patients is crucial for enhancing the quality of healthcare services and guaranteeing secure and efficient medical interventions. This retrospective study aims to look into how drugs are utilized to treat pediatric patients at Secondary Care Hospital.

Methods:

A retrospective analysis was conducted with electronic health records of pediatric patients (0–18 years old) admitted to a Secondary Care Hospital during the period of Jan 2024 and March 2024. Using the proper statistical techniques, information on patient demographics or clinical characteristics, commonly prescribed drugs, routes of administration, classes of drug prescribed, number of branded and generic drugs utilized, utilization of FDC and single dose drugs and utilization of essential drugs were gathered and examined.

Results:

The study comprised 150 pediatric patients, with a mean age of 3-6 years. 64% males and 36% females were among them. The most frequently prescribed drug classes, according to analyses of medication utilization, were Antibiotics 18.66%. Remarkably, Pantoprazole became the most often prescribed drug, accounting for 20.89% prescriptions. 39 generic medications and 114 name-brand medications were prescribed. There were 8 fixed drug combinations whereas there were 145 single dose medicatios. There were 44 drugs included in NLEM whereas there were 109 drugs not included in NLEM.

Conclusion:

The medication use habits of the pediatric patients of Secondary Care Hospital for Children in Kharghar are clarified by this retrospective analysis. The results emphasize prescriptions provided in this group, underscoring the need for more research to improve pediatric pharmacotherapy and guarantee the best possible outcomes for patient care.

Keywords: Drug Utilization, Paediatric, Medication, Generic Prescribing, Retrospective.

ABBREVIATIONS

DU-Drug Utilization, FDC-Fixed Dose Combination, DCGI- Drug Controller General of India,

NLEM- National list of Essential Medicines, WHO- World Health Organization,

DUS-Drug Use Studies,JCAHO-Joint commission on accreditation of Healh care organization,

ADR- Adverse Drug Reaction, DUE- Drug Use Evaluation, DUR- Drug Utilization Review,

ATC- Anatomoical Thereapeutic Chemical, DDD-Defined Daily Dose, DDI- Drug Drug Interaction

INTRODUCTION

The World Health Organization defines drug utilization studies as "drug marketing, distribution, prescription, and use in society with special emphasis on the resulting medical, social, and economic consequences.(Koppartha, Kaniganti and Chodavarapu, 2019)('World Health Organization. International statistical classification of diseases', no date) Studies on the appropriate use of drugs are conducted to assess the economic, convenient, safe, and effective aspects of drug use at every stage of the chain.(SENTHILSELVI *et al.*, 2019) The misuse, overuse, or underuse of medications leads to widespread health risks and the waste of limited resources.(Parekar, Maindarkar and Maindarkar, 2020)(Saqib, Atif and Scahill, 2018) Research on the drug-using process concentrates on variables Use of drugs The scientific field that studies the medical treatment of newborns, kids, and teenagers is called pediatrics. Prescription and drug use patterns primarily concentrate on elements about the writing, dispensing, giving, and taking of prescription drugs as well as the events that go along with them. Youngsters Since a child's physiology differs from an adult's, research on drug use patterns is essential to understanding, interpreting, and improving medication administration, prescribing, and reducing adverse events. It also helps to ensure that medications are used responsibly.(Biradar S. M *et al.*, 2019)(Thiruthopu *et al.*, 2014)

JCAHO (1994) defines Drug/medication utilization evaluation as a continuous, methodical procedure intended to uphold the proper and efficient use of drugs.(Biradar *et al.*, 2019) The purpose of Drug Utilization Evaluation (DUE) studies is to assess the appropriate use of pharmaceuticals and raise the bar for drug administration and prescription practices. The healthcare system can better balance the cost and quality of prescribed drugs by using drug utilization reviews to identify, comprehend, interpret, evaluate, and improve medication prescribing, administration, and use.(Schnitzer *et al.*, 2023)(Ali *et al.*, 2018)(Parthasarathi and Nyfort-Hansen, 2004)

TYPES OF DUE STUDIES

Qualitative: DUE studies are interdisciplinary activities that gather, arrange, examine, and summarize data regarding real-world drug use. Usually, they look into the use of particular drugs or conditions. Criteria are a term that is included in qualitative DU investigations. Criteria are preset standards by which the appropriateness, medical need, and quality of medical care can be evaluated. Drug use criteria might be based on dosage, frequency of dosing, duration of therapy, and indications for use. Qualitative studies evaluate whether drug

use is reasonable and typically establish a connection between prescription data and the justifications (indications) for prescribing. These studies are called DU evaluations or reviews. The procedure, known as a "therapeutic audit," is designed to raise the standard of therapeutic care and is based on predetermined criteria.

Quantitative: The DUE study involves gathering, organizing, and presenting drug use estimates and measures. Typically, this data is utilized to create medication budgets or make purchasing decisions. However, when it comes to the quality of drug use, results from quantitative drug use studies are typically regarded as suggestive rather than conclusive. Combining quantitative and qualitative DUE research can provide insights into the quantity and pattern of drug use as well as its quality.(Jensen *et al.*, 2023)

DUE is necessary to enable the rational use of medications in both populations and individual patients. It also aims to improve doctors' prescribing practices by supplying information on patient symptoms, lab results and their relationship to therapy, and drug-related issues such as adverse drug reactions (ADRs), drug interactions, and other issues.(Gangwar *et al.*, 2023)

CLASSIFICATION OF DUR:

Prospective: The evaluation of a patient's prescription schedule is done before a prescription is filled. As part of the prospective review process, a patient's planned drug therapy is evaluated before medication administration. Before the patient even receives the drug, the chemist can identify and correct problems with this process. Chemists routinely perform prospective assessments as part of their regular work, assessing prescription drug dosage and instructions and reviewing patient records for possible drug interactions or unnecessary therapy. As part of an online claims adjudication procedure, prospective DUR typically employs automated algorithms to perform crucial tests, such as pharmaceutical interactions, duplications, or contraindications with the patient's illness state or condition.

Concurrent: Constant monitoring of medication therapy throughout treatment. Concurrent review, which is done while the patient is receiving therapy, involves monitoring the drug while it is administered to help the patient. It provides chemists with the opportunity to alert physicians to potential problems and react suitably in situations including drug-drug interactions, concurrent therapy, excessive or insufficient use, and high or low dosage.

Retrospective: Following the patient's receipt of medication or drug therapy, a retrospective DUE is carried out. Retrospective analysis searches for trends in the distribution of prescription drugs or the way those drugs are taken. Specialized therapy and suggestions may be designed to stop drug addiction and misuse in the future based on the prescription consumption patterns that are now in place.(Ashok and Subramanian, 2017)(Sachdev *et al.*, 2022)(Spellberg *et al.*, 2011)

The evaluation of drug use is broken down into four stages:

Phase1:Arranging.

1. Create a committee for DUR.

2. Compose guidelines and instructions.

3. Give an overview of the hospital departments that use medication.

4. Evaluate the available resources for important research, data gathering, and analysis.

5. Take into account the drug's indications, dosage, form, and frequency of use when monitoring and assessing.

6. Choose standards and set a benchmark for performance.

7. Create a schedule and develop the approach for gathering and evaluating data.

8. Inform hospital employees about the DUE research and the most recent standards.

Phase2:Gathering and Assessing Data:

9. Begin properly gathering data.

10. Examine the information gathered to see whether there is a drug use issue.

Phase 3: Counter measures:

11. Forward the findings to the medical staff.

12. Create and put into action interventions if drug use is determined to be an issue.

13. Gather fresh information on drug problems to ascertain whether the intervention has improved drug use.

14. Share the outcomes of the reassessments

Phase 4: Program Evaluation

15. At the end of the year, assess every activity related to the DUR program and prepare new initiatives for the following year.(Ashok and Subramanian, 2017)

The WHO ATC/DDD (Anatomical Therapeutic Chemical/Defined daily dose) technique is the accepted standard for drug use. The WHO Collaborating Centre for Drug Statistics and Methodology defines daily dose (DDD) as the presumed average maintenance adult dose per day for each drug and method of administration for its primary indication.(Dhandapani, Sadhasiva and Reddy, 2022)(Kahsu *et al.*, 2015) The use of drugs is a crucial part of many studies looking at the clinical and financial efficacy of pharmacotherapy.(Rashed *et al.*, 2015)(European Commission DG SANTE, no date) DUR can identify inappropriate and/or needlessly expensive drug therapy by comparing actual drug use to predefined standards. Programs are made to keep an eye on specific drugs or drug classes as well as the use of drugs in certain illnesses.(Anil kumarYerragopu *et al.*, 2023)

Providing healthcare to newborns, kids, and teenagers is the main focus of the medical specialty of pediatrics. The healthcare system needs drug utilization studies to better understand, evaluate, and improve the prescription, administration, and use of drugs.(Chabhadiya and Kubavat, 2023)(Upadhyyaya and Tewari, 2023) Prescribers must adapt their knowledge and practices to keep up with the rapid advancements in technology, which calls for an understanding of prescription patterns.(Mao *et al.*, 2015)

A DUE's main goal is to guarantee that medications are taken correctly, safely, and effectively to enhance patients' health. Furthermore, ongoing advancements in the responsible and efficient use of medications have the potential to reduce healthcare costs overall.(Dutta *et al.*, 2017) Studies on drug use are effective investigative instruments for determining the place of drugs in society. They establish a solid sociomedical and health-economic foundation for making decisions about medical care. It is among the best ways to evaluate a doctor's prescription behavior. (Khoshdel, Tomas and Jafari, 2022)(Malhotra, Chandra and Vamsadhara, 2003)('Baksaas I, Lunde PK', no date) Research on drug use is essential to clinical practice because it provides the framework for changes to drug dispensing regulations at local as well as at the national level. (Mittal *et al.*, 2014) The majority of medical consultations end in a prescription because drugs are the most important form of treatment for most diseases. Also, a sizeable amount of healthcare spending is allocated to pharmaceuticals, which are growing faster than other healthcare components in several nations.(Loikas *et al.*, 2013)(P *et al.*, 2022)(Thorpe, 2005) Evidence from DUR is crucial to raising awareness about irrational drug use by

providing feedback to physicians and suggesting actions to improve prescribing behavior, as drug consumption monitoring can reveal issues with drug therapy.(Rosli *et al.*, 2017)(Maguire *et al.*, 2007) Before, during, and after dispensing, DUE entails a thorough review of the patient's prescription and medication data to guarantee appropriate medication, decision-making, and patient outcomes.(Ss, 2021)

Pediatric patients are particularly vulnerable to infectious diseases because of their weakened immune systems and poor nutritional status. Therefore, the DU research makes use of key drug use indicators to encourage the responsible use of drugs.('Antibiotic Prescribing Patterns in Adult Patients According to the WHO AWaRe Classification: A Multi-Facility Cross-Sectional Study in Primary Healthcare Hospitals in Lusaka, Zambia', no date) Studies on drug use are crucial for clinical, educational, and financial reasons, as well as for efficient distribution and regulation. Worldwide, the practice of prescribing drugs irrationally persists, particularly in developing nations. Periodically assessing prescribing patterns can improve therapeutic efficacy, reduce side effects, and give prescribers feedback. (Alam *et al.*, 2006)(Pise *et al.*, 2015)(Lamichhane *et al.*, 2006)

Studies on the use of drugs offer insight into the norms and patterns of drug prescriptions today. Data from these investigations can be applied to determine areas in need of research as well as to assess and adjust clinical prescribing policies. A useful tool for conducting utilization studies is electronic databases, such as dispensing databases, administrative health databases, and health insurance records.(Egunsola, Choonara and Sammons, 2017)

NEED OF THE STUDY.

Studies on drug use are essential for evaluating pharmaceutical practices and the social, medical, and financial ramifications they have. Specifically, in pediatric medicine, understanding medication usage is crucial due to the unique physiological characteristics of children. Despite its significance, there is a dearth of thorough medication usage research specifically designed for juvenile populations.

By emphasizing the appropriate use of pharmaceuticals and the consequences for patients or provision of healthcare, this study attempts to satisfy the need for with drug utilization surveys in pediatric healthcare settings. This research aims to improve the quality and safety of medication management in pediatric patients by examining prescribing trends, administration techniques, and adherence to guidelines.

Medication abuse, addiction, or underuse results in unnecessary health risks and inefficient resource usage. Healthcare systems can better prescribe medications, ensure that they are used rationally within pediatric populations, or identify area of progress by carrying out utilization studies. Promoting evidence-based prescription practices, lowering adverse events, and enhancing children's overall healthcare outcomes all depend on this research.

Drug usage studies with a pediatric focus are desperately needed to improve medication management procedures and improve patient outcomes. Healthcare professionals can enhance the effectiveness, safety, and quality of pharmaceutical use in pediatric patients by monitoring prescribing trends and recommendations compliance. This research will provide insightful information about pediatric pharmacotherapy and direct future initiatives to improve healthcare delivery for children's.

METHODOLOGY

3.1 Materials and Methods

The medical records of 150 patients who were admitted to a hospital for Children in Kharghar were evaluated utilizing the retrospective approach during four months. Patient demographics including age and gender, as well as clinical data regarding medication names, generic names, and classification of the mode of administration, were important areas of focus. The study evaluated prescribed drugs against NLEM India 2022 and analyzed the number of prescriptions for each drug. The study also looked at how Fixed Drug Combination

(FDC) drugs were used, using the lists of approved FDCs the Drug Controller General of India (DCGI) had approved during two periods: 1961 and December 31, 2019, and from August 1 to August 4, 2023.

3.2 Data Collection

Datas were collected from electronic health records. The survey also documented if the given drugs were on the list of essential drugs. The investigation was carried out within the inpatient and outpatient departments. To analyze WHO prescribing indicators, a random sampling technique was used to select 150 prescriptions

RESULTS: -

Table 1: Demographic/Clinical Characteristics Of Patients

CLINICAL CHARACTERISTICS	n
Total number of patients	150
Age groups	
0 days to 1 month	19
1 month to 1 year	28
1 year to 3 year	34
3 year to 6 year	26
6 year to 12 year	33
12 year to 18 year	10
Sex	
Male	96
Female	54
Number of drugs prescribed	153

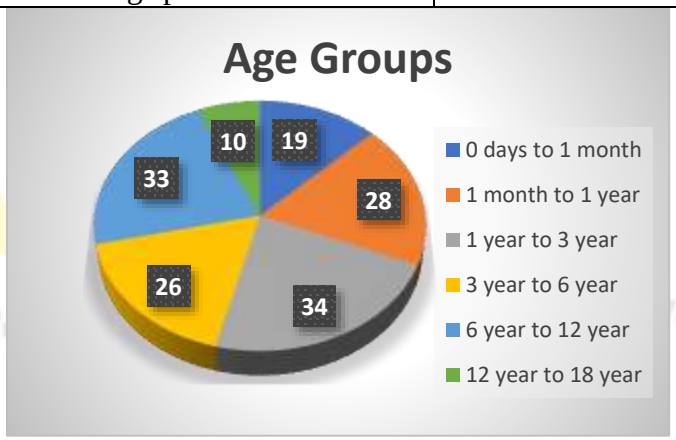

Fig.01: Distribution Of Age Group As Per Number Percentage

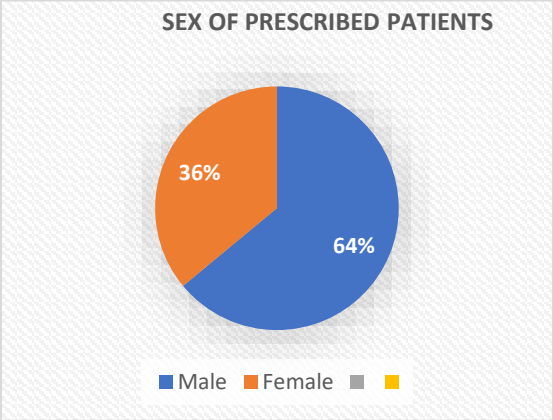

Fig.02: Distribution Of Gender As Per Number Percentage

this present study, we studied 150 Patients' case records, and the age criteria were illustrated above in Table 1. There were 96 Male patients and 54 Female patients.

Table 2: List Of Commonly Prescribed Drugs

Drug Administered	**n**	**%**
Pantoprazole	337	20.89
Ondansetron	223	13.82
Paracetamol	125	7.74
Diclofenac Sodium Suppositories	18	1.11
Dextromethorphan Hydrobromide Cholrpheniramine Maleate & Phenylepinephrine Hydrochloride	23	1.42
Norepinephrine	1	0.06
Ipratropium Bromide & Levasalbutamol	42	2.63
Multivitamin & Multimineral	2	0.12
Vancomycin Hydrochloride	13	0.8
Azithromycin	19	1.17
Ceftriaxone	40	2.47
Cefixime	3	0.18
Zinc Dry Powder	26	1.61
Oseltamivir Phosphate	14	0.86

Linezolid	2	0.12
Levosalbutamol And Ipratropium	43	2.66
Metronidazole	61	3.78
Amikacin Sulphate	1	0.06
Anesthetic Antacid Gel	12	0.74
Dicyclomine Hydrochloride	2	0.12
Sodium Citrate & Citric Acid	2	0.12
Piperacillin And Tazobactam	15	0.92
Carminative Mixture With Digestive Enzyme	2	0.12
Midazolam	16	0.99
Clobazam	13	0.8
Lactobacillus Rhamnosus Gg	48	2.97
Vitamin K	21	1.3
Levodropizine & Chlorpheniramine Maleate	3	0.18
Calamine Lotion	3	0.18
Tramadol Hcl & Diclofenac Sodium	4	0.24

Dextromethorphan Hcl & Phenlyephrine Hcl & Chlorpheniramine	49	3.03
Lactulose Solution	1	0.06
Hydrocortisome Sodium Succinate	35	2.16
Ambroxol Hcl & Guaiphenesin & Terbutaline Sulphate & Menthol	2	0.12
Xylometazoline	2	0.12
Lactaid Drop	13	0.8
Cetrimide & Calamine & Dimethicone & Zinc Oxide	3	0.18
Clotrimazol	2	0.12
Cetrizine Dhydrochloride	2	0.12
Dobutamine	3	0.18
Cephalosporin	2	0.12
Calcium Gluconate	7	0.43
Sildenafil	2	0.12
Dopamine Hcl	2	0.12
Rabeprazole	12	0.74
Cefoparazone & Salbactum	6	0.37

Vitamoin D3 Oral Solution	1	0.06
Dexamethazone	3	0.18
Ibuprofen & Paracetamol	1	0.06
Levetiracetam	7	0.43
Lactic Acid Bacillus Zinc And B Complex	3	0.18
Mannitol	4	0.24
Tannic Acid And Lignocaine	3	0.18
Cefpodoxime Proxetil	3	0.18
Domperidone	3	0.18
Glycerin Suppository	5	0.3
Artesunate	10	0.61
Clindamycin	3	0.18
Primaquine	5	0.3
Fexofeinadine Hcl	11	0.68
Mutlivitamin And Multimineral	5	0.3
Dill Oil Fennel Oil Simethicone	1	0.06
Multivitamin	12	0.74

Dextromethorphan	7	0.43
Glycerine & Sodium Chloride	1	0.06
Hydroxyzine Hcl	1	0.06
Piperacillin & Tazobactam	15	0.92
Cholecalciferol	4	0.24
Calcium Phosphorus Magnesium Zinc & Vitamin D3	1	0.06
Magnessium Sulphate	3	0.18
Cefoperazone & Sulbactam	9	0.55
Phenlyephrine Chlorpheniramine Dextromethorphan	3	0.18
Pheniramine Maleate	6	0.37
Artemether & Lumefantrine	5	0.3
Choline Salicylate & Lignocaine Hcl	5	0.3
Aceclofenac &Paracetmol	7	0.43
Amoxicillin & Clavulanate Potassium	19	1.17
Disodium Hydrogen Citrate	3	0.18

Prednisolone	4	0.24
Secukinumab	1	0.06
Levosalbutamol Hcl & Budesonide	12	0.74
Phenlyephrine Hcl & Chlorpheniramine Maleate	2	0.12
Triclofos	2	0.12
Polyethlyene Glycol	6	0.37
Triamcinolone	3	0.18
Phenytoin Sodium	4	0.24
Meropenam	4	0.24
Chloroquine Phosphate	2	0.12
Primaquine Phosphate	5	0.3
Furosemide	5	0.3
Milrinone Lactate	3	0.18
Lansoprazole Gastro Resistant Capsule	2	0.12
Ceftriaxone And Sulbactum	3	0.18
Prednisolone Dispersible Tablet	1	0.06

Amoxycillin & Potassium Clavulanate	1	0.06
Acetylcholine	1	0.06
Sucralfate Suspension	1	0.06
Multivitamin Multimineral & Antioxidant Suspension	3	0.18
Saccharomyces Boulardii	24	1.48
Mupirocin & Bromelain Ointment	1	0.06
Fluconazole	1	0.06
Caffeine Citrate	1	0.06
Hydrochlorothiazide	1	0.06
Amino Acid Solution For Iv	1	0.06
Cefoperazone & Salbuctam	1	0.06
Benzoylmetronidazole	1	0.06
Amitriptyline Hcl	3	0.18
Vitamin C Chewable Tablet	3	0.18
Carboxymethylcellulose	1	0.06
Zinc Acetate Oral Solution	6	0.37

Octreotide	3	0.18
Cefpodoxime	1	0.06
Ambroxol Levosalbutamol Guaifenesin	3	0.18
Oseltamivir	2	0.12
Diclofenac Sodium And Pareacetamol Tablet	2	0.12
Methylprednisolone Sodium Succinate	2	0.12
Ciprofloxacin & Dexamethasone	2	0.12
Cefotaxime Sodium	31	1.92
Sretile Noradrenaline Cocentrate	2	0.12
Rapamune	4	0.24
B4 Nappi	2	0.12
Omega 3 Liquid	2	0.12
Atarax	2	0.12

In the present study the most frequently drugs used were Pantoprazole (20.89%), Ondansetron(13.82%), Paracetamol(7.74%), Metronidazole(3.78%), Ceftriaxone(2.47%).

Table 3: Route Of Administration

ROUTES OF ADMINISTRATION	**n**	**DRUGS**
IV	44	1.PANTOPRAZOLE
		2.ONDANSETRON
		3.PARACETAMOL
		4.NOREPINEPHRINE
		5.VANCOMYCIN HYDROCHLORIDE
		6.CEFTRIAXONE
		7.LINEZOLID
		8.METRONIDAZOLE
		9.AMIKACIN SULPHATE
		10.PIPERACILLIN AND TAZOBACTAM
		11.MIDAZOLAM
		12.VITAMIN K
		13.TRAMADOL HCL & DICLOFENAC SODIUM

		14.HYDROCORTISOME SODIUM SUCCINATE
		15.CETRIZINE DHYDRO-CHLORIDE
		16.DOBUTAMINE
		17.CEPHALOSPORIN
		18.CALCIUM GLU-CONATE
		19.SILDENAFIL
		20.DOPAMINE HCL
		21.RABEPRAZOLE
		22.CEFOPARAZONE & SALBACTUM
		23.DEXAMETHAZONE
		24.LEVETIRACETAM
		25.LACTIC ACID BACIL-LUS ZINC AND B COM-PLEX
		26.MANNITOL
		27.ARTESUNATE
		28.CLINDAMYCIN
		29.PIPERACILLIN & TAZOBACTAM
		30.MAGNESSIUM SUL-PHATE
		31.PHENIRAMINE MALE-ATE
		32.AMOXICILLIN & CLAVULANATE POTAS-SIUM
		33.PHENYTOIN SODIUM
		34.MEROPENAM
		35.FUROSEMIDE
		36.MILRINONE LACTATE
		37.FLUCONAZOLE
		38.CAFFEINE CITRATE
		39.AMINO ACID SOLU-TION FOR IV
		40.OCTREOTIDE
		41.DICLOFENAC SODIUM AND PAREACETAMOL TABLET
		42.METHYLPREDNISO-LONE SODIUM SUCCIN-ATE
		43.CEFOTAXIME SODIUM
		44.SRETILE NORADREN-ALINE COCENTRATE
RECTAL	6	1.DICLOFENAC SODIUM SUPPOSITORIES
		2.GLYCERIN SUPPOSI-TORY

		3.GLYCERINE & SODIUM CHLORIDE
		4.PREDNISOLONE
		5.LEVOSALBUTAMOL HCL & BUDESONIDE
		6.SUCRALFATE SUSPENSION
ORAL	64	1.DEXTROMETHORPHAN HYDROBROMIDE CHOLRPHENIRAMINE MALEATE & PHENYLEPINEPHRINE HYDROCHLORIDE
		2.PARACETAMOL
		3.MULTIVITAMIN & MULTIMINERAL
		4.AZITHROMYCIN
		5.CEFIXIME
		6.ZINC DRY POWDER
		7.OSELTAMIVIR PHOSPHATE
		8.ANESTHETIC ANTACID GEL
		9.DICYCLOMINE HYDROCHLORIDE
		10.SODIUM CITRATE & CITRIC ACID
		11.CARMINATIVE MIXTURE WITH DIGESTIVE ENZYME
		12.MIDAZOLAM
		13.CLOBAZAM
		14.LACTOBACILLUS RHAMNOSUS GG
		15.LEVODROPIZINE & CHLORPHENIRAMINE MALEATE
		16.DEXTROMETHORPHAN HCL & PHENLYEPHRINE HCL & CHLORPHENIRAMINE
		17.LACTULOSE SOLUTION
		18.AMBROXOL HCL & GUAIPHENESIN & 19.TERBUTALINE SULPHATE & MENTHOL
		LACTAID DROP
		20.CLOTRIMAZOL
		21.VITAMOIN D3 ORAL SOLUTION
		22.IBUPROFEN & PARACETAMOL
		23.LEVETIRACETAM
		24.CETRIZINE
		25.CEFPODOXIME PROXETIL
		26.DOMPERIDONE

		27.PRIMAQUINE
		28.FEXOFEINADINE HCL
		29.DILL OIL FENNEL OIL SIMETHICONE
		30.HYDROXYZINE HCL
		31.CHOLECALCIFEROL
		32.CALCIUM PHOSPHORUS MAGNESIUM ZINC & VITAMIN D3
		33.PHENLYEPHRINE CHLORPHENIRAMINE DEXTROMETHORPHAN
		34.ARTEMETHER & LUMEFANTRINE
		35.ACECLOFENAC &PARACETMOL
		36.DISODIUM HYDROGEN CITRATE
		37.PREDNISOLONE
		38.LEVOSALBUTAMOL HCL & BUDESONIDE
		39.TRICLOFOS
		40.CHLOROQUINE PHOSPHATE
		41.FUROSEMIDE
		42.LANSOPRAZOLE GASTRO RESISTANT CAPSULE

		43.ONDANSETRON
		44.AMOXYCILLIN & POTASSIUM CLAVULANATE
		45.SUCRALFATE SUSPENSION
		46.MULTIVITAMIN MULTIMINERAL & ANTIOXIDANT SUSPENSION
		47.SACCHAROMYCES BOULARDII
		48.FLUCONAZOLE
		49.CAFFEINE CITRATE
		50.BENZOYLMETRONIDAZOLE
		51.VITAMIN C CHEWABLE TABLET
		52.ZINC ACETATE ORAL SOLUTION
		53.AMBROXOL LEVOSALBUTAMOL GUAIFENESIN
		54.OSELTAMIVIR
		55.RAPAMUNE
		56.OMEGA 3 LIQUID
		57.ATARAX
		58.AMITRIPTYLINE HCL

		59.HYDROCHLOROTHIA-ZIDE
		60.POLYETHLYENE GLY-COL
		61.TRIAMCINOLONE
		PHENLYEPHRINE HCL &62.CHLORPHENIRA-MINE MALEATE
		63.CEFPODOXIME PROX-ETIL
		64.CHOLINE SALICYLATE & LIGNOCAINE HCL
NASAL	5	1.IPRATROPIUM BRO-MIDE & LEVASALBUTA-MOL
		2.MIDAZOLAM
		3.XYLOMETAZOLINE
		4.PREDNISOLONE
		5.LEVOSALBUTAMOL HCL & BUDESONIDE
		1.PARACETAMOL
		2.CEFTRIAXONE
		3.AMIKACIN SULPHATE
		4.MIDAZOLAM
		5.VITAMIN K

		6.TRAMADOL HCL & DI-CLOFENAC SODIUM
		7.HYDROCORTISOME SO-DIUM SUCCINATE
		8.CEPHALOSPORIN
		9.CEFOPARAZONE & SAL-BACTUM
		10.DEXAMETHAZONE
		11.LACTIC ACID BACIL-LUS ZINC AND B COM-PLEX
		12.ARTESUNATE
		13.CLINDAMYCIN
		14.PHENIRAMINE MALE-ATE
		15.ONDANSETRON
		16.CEFTRIAXONE AND SULBACTUM
		17.OCTREOTIDE
		18.DICLOFENAC SODIUM AND PAREACETAMOL TABLET
		19.CEFOTAXIME SODIUM
		20.ATARAX
BUCCAL	1	MIDAZOLAM

SUBCUTANE-OUS	2	1.VITAMIN K
		2.RABEPRAZOLE
TRANSDERMAL	2	1.CALAMINE LOTION
		2.CETRIMIDE & CALA-MINE & DIMETHICONE & ZINC OXIDE
TOPICAL	3	1.SUCRALFATE SUSPEN-SION
		2.MUPIROCIN & BROME-LAIN OINTMENT
		3.B4 NAPPI
OPHTHALMIC	2	1.CIPROFLOXACIN & DEXAMETHASONE
		2.CARBOXYMETHYL-CELLULOSE

The most frequent route of administration found in the current study was the Oral route, followed by the IV route.

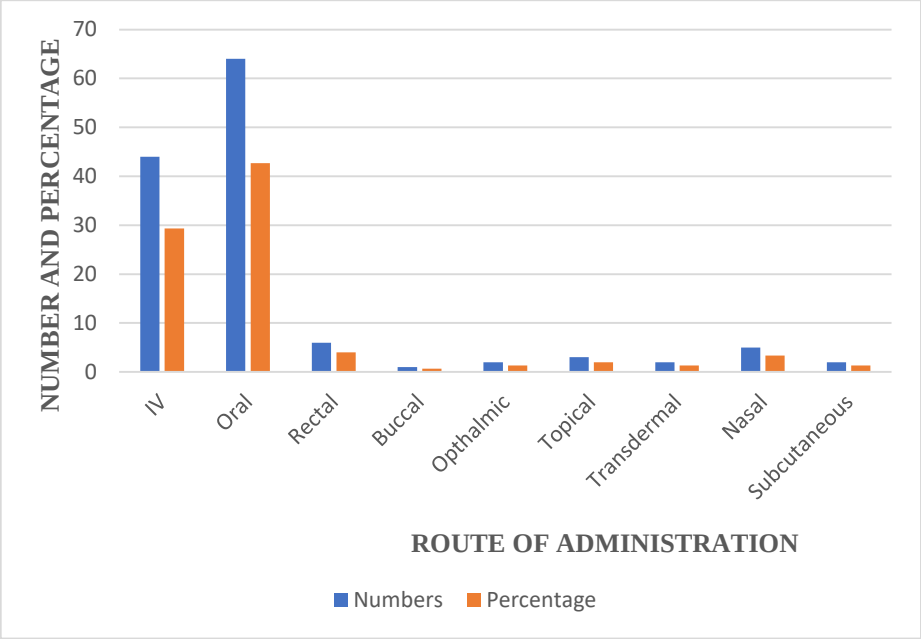

Fig. 03: Distribution Of Routes Of Administration In Patients

Table 4: Classes Of Drugs Prescribed

Classes Of Drugs Administered	**n**
Antacid	3
Anti-Emetics	2
Painkiller	1
Nsaids	6
Expectorants	2
Alpha-Beta Adrenergic Agonists	1
Analgesic And Anti-Pyrectic	2
Cephalosporin Antibiotics	4
Bronchodilator Agents	2
Antioxidant	3
Antipyretic And Analgesic	1
Glycobiotic Antibiotics	1
Macrolide Antibiotics	1
Antibiotic	28
Mineral Supplements	2

Neuraminidase Inhibitor	1
Bronchodilator	2
Antimicrobial	2
Aminoglycoside Antibiotyic	1
Antispasmodoics, Analgesic, Antipyretic	1
Gastrointestinal Agent	1
Penicillin Antibiotic	1
Macrolides	1
Pain-Relieving And Antispasmodic	1
Benzodiazepine	3
Probiotic	4
Fat-Soluble Vitamin	1
Anti-Histamines & Cough Suppresants	1
Anti-Inflammatory And Antipruritic	1
Multivitamin	8
Opioid Analgesics	1

Cough And Cold Preparations	3
Osmotically Acting Laxatives	1
Corticosteroids	5
Nasal Decongestants	2
Topical Dermatological Agents	1
Pain-Killers Or Analgesics	1
Analgesics & Antipyretics	1
Anti-Fungal Medications Known As Imidazoles	1
Antihistamines	5
Inotropic Agents	2
Hypocalcemia, Cardiotoxicity	1
Pde5 Inhibitors	1
Catecholamine Neurotransmitter	1
Proton Pump Inhibitors	3
Vitamin Supplement	1
Anticonvulsants (Or Anti-Epileptics)	2
Diuretic	3
Decongestants	3

Dopamine Antagonist	1
Hyperosmotic Laxatives	1
Antimalarials	2
Lincomycin Antibiotics	1
Antiprotozoals	2
Antitussives	1
Stimulant Laxative	1
Penicillins And Beta-Lactamase Inhibitors	1
Multi-Minerals Or Supplements	1
Anticonvulsant And An Electrolyte Replenisher	1
Urine Alkalizer	1
Interleukin-17a Antagonist	1
Steroids	6
Osmotic-Type Laxative To Treat Constipation	1
Inotropic Agents; Phosphodiesterase Enzyme Inhibitors	1
Provides Balanced And Nutrients For The Baby	1
Mucolytics Agent	4

Ulcer Protectants	1
Nutritional Supplement	3
Triazole Antifungal	1
Tricyclic Antidepressants	1
Topical Ophthalmic Lubricants	1
Octapeptides	1
Antiviral Medicine	1

Interleukin-17a (Il-17a) Receptor Inhibitors	1
Fluoroquinolone Antibiotics	1
Sympathomimetic Drug	1
Immunosuppressants	1
Skin Protective Cream	2
Antilipemic Class	1

The most commonly prescribed class of drug was Antibiotics (18.66%), followed by Multivitamin (5.33%)& NSAIDs (4%) &Antihistamines (3.33%)

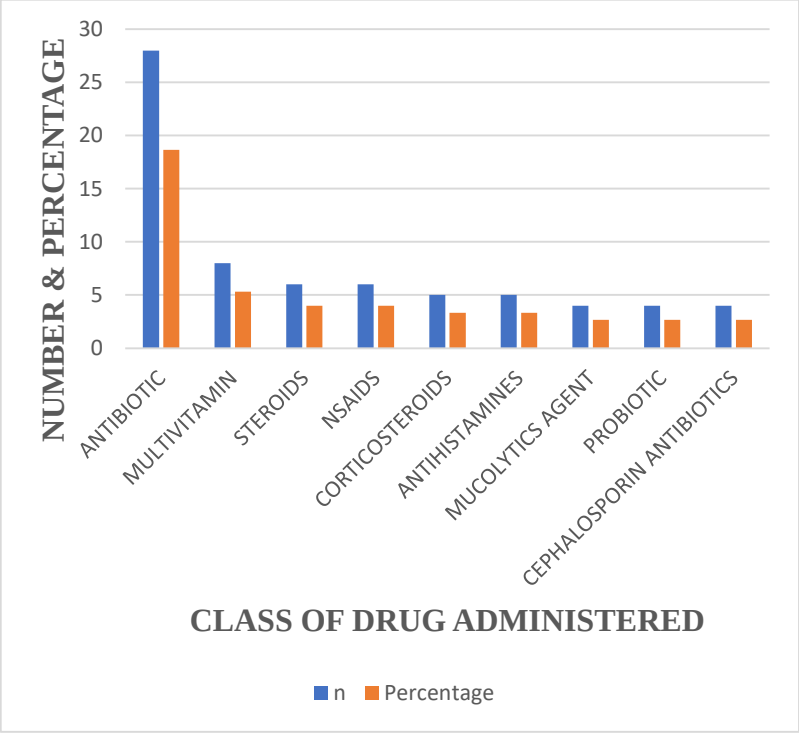

Fig. 04: Distribution Of Drug Prescribed As Per The Classification

Table 5: Number & Percentage Of Branded And Generic Drugs Utilized

TYPES OF DRUG UTILIZED	n	PERCENTAGE
GENERIC DRUGS	39	25
BRANDED DRUGS	114	75

The number of generic drugs prescribed to the patients are 39 while the branded drugs are 114 and percentage is 25% and 75% respectively.

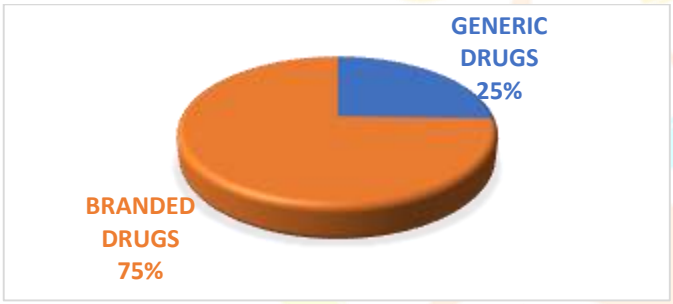

Fig. 05: Distribution Of Drug Prescribed As Per The

Generic & Branded Drugs

Table 6: Utilization Of Fdc And Single Drugs In Study Patients

Drug Utilized	n
FDC	8
Single Dose	145

FDC- Fixed Dose Combination

Total 8 FDC Drugs were prescribed to the patients while 145 single drugs are prescribed

Table 07: Utilization Of Essential Drugs In Study Patients

Essential Drugs Utilization	**n**
Drugs included in NLEM	44
Drugs not included in NLEM	109

NLEM - National List of Essential Medicine

The drugs included in National list of essential medicines are 44 while 109 drugs are not included in the essential list of medicines.

Table 08: Who Prescribing Indicators Assessed

WHO Prescribing Indicators	**Data**
Average number of drugs per patient encounter	12.93
Percentage drugs prescribed by generic names	25.49
Percentage patient encounters with an antibiotic	22.22
Percentage patient encounters with an injection	41.83
Percentage drugs from essential drug list	28.75

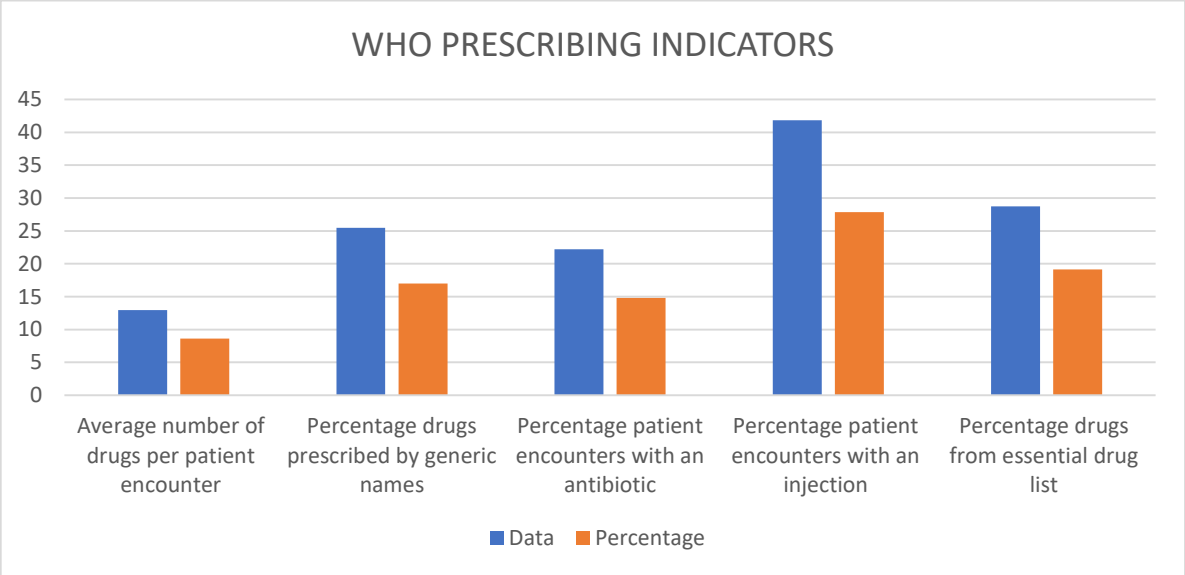

Fig. 06: Graphical Representation Of Drug Prescribed As Per Who Prescribing Indicators

DISCUSSION

The table 1 presents the demographic and clinical characteristics in which we found that the 150 patients in this study were distributed differently in terms of age, with the largest cohort being 1 to 3 years old (34 patients), closely followed by 6 to 12 years old (33 patients). In contrast, the smallest group consisted of 10 patients who were adolescents between the ages of 12 and 18. In addition, there were significantly more male patients (96) than female patients (54). These results highlight potential inequities that call for additional research to promote fair healthcare service and emphasize the significance of taking age and sex demographics into account when designing healthcare interventions. The prescription of 153 medications, which was more than the total number of patients, was an interesting discovery that suggested a high prescription load per patient.

The table 2 presents a thorough summary of the medications prescribed to the patient group under investigation, as well as the frequency of prescriptions. Notably, 20.89% of prescriptions were for pantoprazole, and 13.82% were for ondansetron, making them the most prescribed drugs. After that, paracetamol accounted for 7.74% of prescriptions. The data also showed a broad range of drugs that were given, encompassing different therapeutic classes and indications. Certain drugs, however, showed reduced prescription rates, which may indicate a decrease in the frequency of usage in the clinical context or a decrease in the prevalence of the related conditions.

The distribution of drugs among the patient population according to the mode of administration is shown in the table 3. With 44 prescriptions for various medications like Pantoprazole, Ondansetron, and Metronidazole, among others, intravenous administration was the most common method of administration. This suggests that many diseases are severe and important and require prompt attention. The six prescriptions for rectal administration were mostly diclofenac sodium suppositories and prednisolone; these prescriptions suggest the use of targeted treatment strategies or situations in which oral delivery may not be practical. The most prescriptions (64), all of which were for oral administration, included a wide variety of drugs, such as azithromycin, paracetamol, levodropropizine, and chlorpheniramine maleate. This suggests that oral drug delivery is preferred for treating a variety of conditions, perhaps because it is more convenient for patients to take. Five prescriptions were administered nasally, including: Ipratropium Bromide & Levasalbutamol, Midazolam, Xy-

lometazoline, Prednisolone, Levosalbutamol HCl & Budesonide. Twenty intramuscular prescriptions for medications, including the following: Amikacin Sulphate, Diclofenac Sodium, Hydrocortisone, Midazolam, Vitamin K, Tramadol HCl, Clindamycin, Sulbactum Octreotide, Ondansetron, and others while tablets of Cefotaxime Sodium, Atarax, and Diclofenac Sodium with Paracetamol. One prescription involved buccal administration, specifically Midazolam. Two prescriptions were administered subcutaneously, including: Vitamin K and Rabeprazole. Two prescriptions were administered Transdermally which includes Calamine Lotion and Cetrimide & Calamine & Dimethicone & Zinc Oxide. Three prescriptions were administered topically: Sucralfate Suspension, Mupirocin & Bromelain Ointment, B4 Nappi. Two prescriptions were administered ophthalmically: Ciprofloxacin & Dexamethasone and another is Carboxymethylcellulose.

Table 4 provides a summary of the classes of drugs prescribed along with their frequencies: Antibiotics are the most frequently prescribed medications (28 prescriptions), including Cephalosporins, Macrolides, Penicillins, etc. Painkillers, NSAIDs, and particular classes such as Analgesic and Anti-pyretic (total of 11 prescriptions) are included in the category of Analgesics and Antipyretics. Bronchodilators, expectorants, nasal decongestants, and preparations for cough and colds (a total of 14 prescriptions) are examples of respiratory medications. Gastrointestinal Medications such as Antacids, Gastrointestinal Agents, Proton Pump Inhibitors (total of 7 prescriptions). Vitamins and Supplements like Multivitamins, Mineral Supplements, Probiotics, Nutritional Supplements (total of 19 prescriptions). Other Medications are Steroids, Antihistamines, Antidepressants, Antivirals, Immunosuppressants, etc. This diverse range of medications reflects the variety of medical conditions being treated and the holistic approach to patient care.

The data presented in Table 5 indicates a notable disparity in the utilization of branded and generic medications, with 114 branded pharmaceuticals include drugs like NSAIDs, Alpha-Beta Adrenergic Agonists, Antioxidant, Antibiotic, Bronchodilator and others while 39 generic drug such as Antacid, Anti-Emetics, Anti-Pyrectics & Analgesic, Antibiotics, Anti-Protozoal, etc. are the occurrences being differentiated. This could suggest a predilection for writing prescriptions for name-brand medications over their generic counterparts. Because of the potential financial effect of this preference for branded drugs, further investigation into the factors influencing prescription decisions is required.

Table 6 reveals data with 145 recorded instances of single medications, the data shows that most research patients received single drugs; only 8 instances of Fixed-Dose Combination (FDC) drugs like Dextromethorphan Hydrobromide Chlorpheniramine Maleate and Phenyl epinephrine Hydrochloride; Piperacillin and Tazobactam; Ibuprofen and Paracetamol; Ambroxol and Guaiphenesin and Terbutaline; Amoxicillin and Clavulanate Potassium; Tramadol HCL AND Diclofenac Sodium; Cefoperaxone and Salbactam; Ciprofloxacin and Dexamethasone were given. This may indicate a general tendency in the treatment regimens of the patients being studied toward the preference of single medications over FDCs. To fully understand the factors influencing this preference—such as cost-effectiveness, safety, or efficacy—more research may be required.

Table 7 describes the National List of Essential Medicines (NLEM) which has 44 medications that include Anti-Emetics, Anti-Pyrectics & Analgesic, NSAIDs, Antibiotic, Antimicrobials and otherts were prescribed to study participants, but 109 medications that are not on the list were also used. This is the pattern of using essential medications. This may indicate differences in prescribing patterns or accessibility concerns, as it implies a substantial dependence on non-NLEM medications. This utilization pattern's effects on healthcare outcomes, costs, and adherence to critical medicine guidelines could all be investigated further through additional investigation.

The evaluation of WHO prescription metrics yields some noteworthy results in table 8.First off, a thorough examination of prescribing procedures is necessary due to the high average number of drugs prescribed each patient encounter (12.93), which may indicate problems with polypharmacy. Second, there is potential for improvement in the promotion of generic prescribing, which could increase accessibility and cost-effectiveness, given the comparatively low number of medications prescribed by generic names (25.49%). Thirdly,

even though the proportion of patients who receive antibiotics (22.22%) is not particularly large, it does highlight the significance of using medicines sparingly in order to reduce the development of antibiotic resistance. Fourth, a substantial portion of patient interactions (41.83%) include injections, indicating a dependence on injectable drugs. This calls for additional research into safety and appropriateness issues. Finally, even though 28.76% of prescriptions are derived from the essential drug list, there is need for improved adherence to essential medicine recommendations to guarantee that patients receive the essential drugs that the World Health Organization recommends. All things considered, these results point to areas where prescribing procedures should be improved to improve patient care, cost-effectiveness, and adherence to evidence-based recommendations.

CONCLUSION

This research, which identifies opportunities for healthcare delivery improvement, offers insightful information about prescription trends and pharmaceutical use. Healthcare practitioners can optimise patient care, increase cost-effectiveness, and slow the emergence of resistance to antibiotics by addressing polypharmacy, encouraging generic prescribing, and strengthening adherence to critical medicine standards. To investigate the fundamental causes influencing prescription patterns and trends in medicine use, more research is advised.

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