



**ASSESSMENT OF DRUG USE PATTERN IN PAEDIATRICS USING WHO
PRESCRIBING INDICATORS IN A TERTIARY CARE HOSPITAL**

Dr. Shyam Nandan Yadav¹, Dr. Beulah Milton^{2*} and Dr. Amit Kumar Pandit³

¹Assistant Professor, Department of Pharmacy Practice, RR College of Pharmacy.

²HOD and Professor, Department of Pharmacy Practice, RR College of Pharmacy.

³Pharm D Graduate, Department of Pharmacy Practice, RR College of Pharmacy.

***Corresponding Author: Dr. Beulah Milton**

HOD and Professor, Department of Pharmacy Practice, RR College of Pharmacy.

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ABSTRACT

Introduction: Drugs use should be rational in specialized population, especially in pediatrics. Hence the present study was conducted in order to study the drug use patterns in pediatric population using WHO prescribing indicators. **Methodology:** A Prospective observational study was carried out in 160 patients for a period of 6 months at a tertiary care hospital. **Results and Discussion:** The male patients were more than female patients. Majority of the Pediatric patients were in the age group between 1 to 3 years. Most of the patients were suffering from gastrointestinal diseases followed by lower respiratory tract infections. The drugs in pediatrics were mostly prescribed by parenteral route. The classes of drugs commonly prescribed were antibiotics followed by bronchodilators. The number of drugs per prescription was found to be with a minimum of 3 and maximum of 5. Most of the drugs were prescribed by brand name. Overuse of antibiotics can result in adverse events and detrimental effects on the gut microbiota. Increased use of parenteral treatment can lead to pain on injection site and cause difficulty in reversing its physiological effects. The number of drugs prescribed for pediatrics should be reduced as prescribing many drugs will lead to polypharmacy, drug interaction and drug related problems. Prescribing by generic name should be encouraged. Rational drug use and evidence based medicine should be instituted. **Conclusion:** There was noncompliance seen with the WHO prescribing indicators. Periodic evaluation of drug use patterns is needed in pediatrics to improve the therapeutic benefits and reduce adverse effects.

KEYWORDS: Pediatrics, drug use patterns, World Health Organization Prescribing Indicators.

INTRODUCTION

Drugs use should be rational in specialized population, especially in pediatrics because, the physiology of pediatrics patients differs from adult population such that the special care is required while prescribing drugs to the pediatric patients. Hence the current study was under taken to study the prescribing pattern of drugs in pediatric patients using WHO prescribing indicators^[1], which includes the average number of drugs per encounter, percentage encounter prescribed injections, percentage encounter prescribed antibiotics, percentage of drugs prescribed with generic name and percentage of drugs prescribed in the essential drug list. Pediatric populations are more prone to suffer from recurrent infections of the respiratory tract and gastrointestinal system. Lower respiratory tract infections are the leading cause of death in children below 5 five years of age. Majority proportion of the pediatrics hospital visits are due to the common childhood illnesses such as acute respiratory infection, acute watery diarrhea and viral fever.^[2]

The pharmaceutical care is essential in pediatric population due to their altered physiology; pharmacokinetics and pharmacodynamics from adult populations which make pediatric population easily prone to drug related problems, medication errors, therapeutic duplication and medication errors. Pharmaceutical companies marketing drugs for children's medicines tend to be small and the range of doses used may be wide for any drug formulation because many drugs prescribed widely for infants and children are not available in suitable dosage forms and compatible formulations leading to a lack of attention and updated knowledge towards pediatric medicines. Knowledge of drug administration in children and infants lags behind that of adults for many reasons including developmental differences that affect the pharmacodynamics and pharmacokinetic profiles of drugs as these studies are mainly carried out in adults whose physiology differ from that of children's, ethical and financial reasons, research capabilities, and regulatory guidelines, constraint and consent to

participate in the research studies.^[3,4]

Children's are often frequently exposed group of population to adverse effects of the drugs as their physiological, pharmacokinetic and pharmacodynamics is different from that of the adults. The adverse effect of the drugs in children doesn't contain much literature evidence from the studies as such studies are limited in children's. Prescribing and administrating of drugs to children needs expertise and updated knowledge as doses and formulations prescribed for children's are not commercially available in the market and sometimes they may also be prescribed for off- label use. Rational use of drugs is important for every patient, especially extremely important in case of children.^[5]

METHODOLOGY

Study site: Sapthagiri Institute of Medical sciences and Research centre, Bangalore.

Study design: Prospective observational studies.

Study Period: The observational study is for 6 months from December 2019 to May 2020.

Patient Selection: Inclusion criteria: Children age less than 12 years admitted in pediatric ward.

Exclusion criteria: Critically ill patients and out patients were excluded from the study.

Study material: The case records of patients from the pediatric ward during the study period were analyzed. A specially designed data entry format was used to collect all patient details like patient name, age, sex, weight, inpatient number, date of admission, date of discharge, reason for admission, past medical history, any surgical

procedures done, vital signs like temperature, BP and pulse/respiratory rate. Provision is given in the format to enter laboratory investigations, diagnosis made and number of drugs prescribed.

Analysis of data was done using WHO core drug use indicator namely

Prescribing Indicators: Average number of drugs per encounter, Percentage of drugs prescribed by generic name, Percentage of encounters with an antibiotic prescribed, Percentage of encounters with an injection prescribed. Drugs included in essential drug list.

Statistical Analysis: The data obtained and the patient related parameters were computed using MS Excel 2007.

RESULTS

Drug use pattern in a total of 160 pediatric patients were analyzed using the World Health Organization (WHO) prescribing indicators during 6 month study period in a tertiary care hospital in Bangalore. The number of male patients was more than the female patients. Majority of Pediatrics were between 1 to 3 years of age. Most of the pediatrics was suffering from gastrointestinal diseases followed by Lower respiratory tract infections. The classes of drugs commonly prescribed were antibiotics followed by bronchodilators. The most frequently prescribed drug among the antibiotics was cephalosporins followed by betalactum antibiotics. The number of drugs per prescription was found to be with a minimum of 3 and maximum of 5 drugs. Most of drugs were prescribed in parenteral route followed by oral route. Drugs prescribed by generic name were lower than WHO standards. Most of the drugs were prescribed by brand names. Drugs prescribed from essential drug list were lower than WHO standards.

Table 1: GENDER WISE DISTRIBUTION

GENDER	FREQUENCY	PERCENT
MALE	90	56.25
FEMALE	70	43.75
TOTAL	160	100

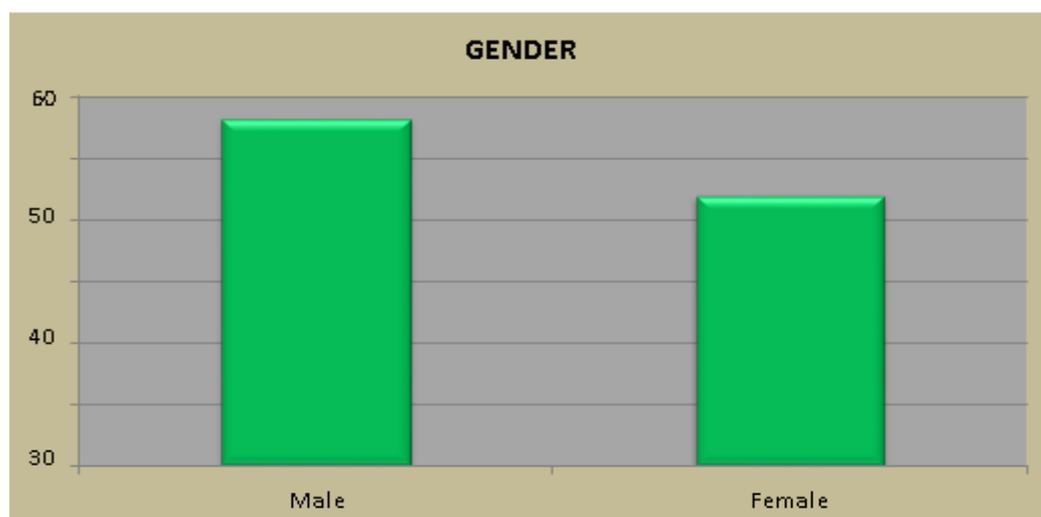


Table 2: Age Wise Distribution.

AGE	FREQUENCY	PERCENT
NEONATES (0-30 DAYS)	02	1.25
INFANTS (1-12 MONTHS)	20	12.5
1-3YEARS	70	43.75
4- 6YEARS	38	23.75
7- 9YEARS	20	12.5
10-12YEARS	10	6.25
TOTAL	160	100



Table 3: Diagnosis Patterns In Paediatrics.

DISEASES	FREQUENCY	PERCENT
GI DISEASES	46	28.75
LRTI	30	18.75
UTI	25	15.62
SEIZURES	20	12.5
PYREXIA	15	9.37
MENINGITIS	10	6.25
SEPSIS	08	05
EAR INFECTIONS	06	3.75
TOTAL	160	100

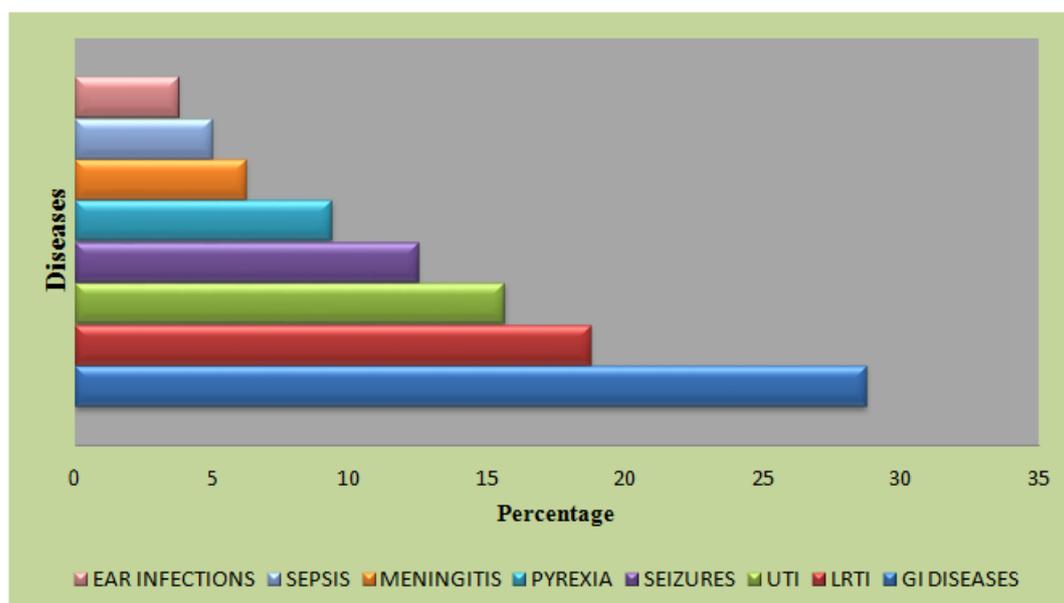


Table 4: Category of Drugs Prescribed.

CATEGORY OF DRUGS	FREQUENCY	PERCENT
ANTI- BIOTICS	302	35.28
BRONCHODILATORS	136	15.88
ANTIULCERS	128	14.95
ANTIEPILEPTICS	96	11.21
ANALGESICS	68	7.94
ANTIPYRETICS	52	6.07
ANTIHISTAMINES	43	5.02
ANTIEMETICS	31	3.62
TOTAL	856	100%

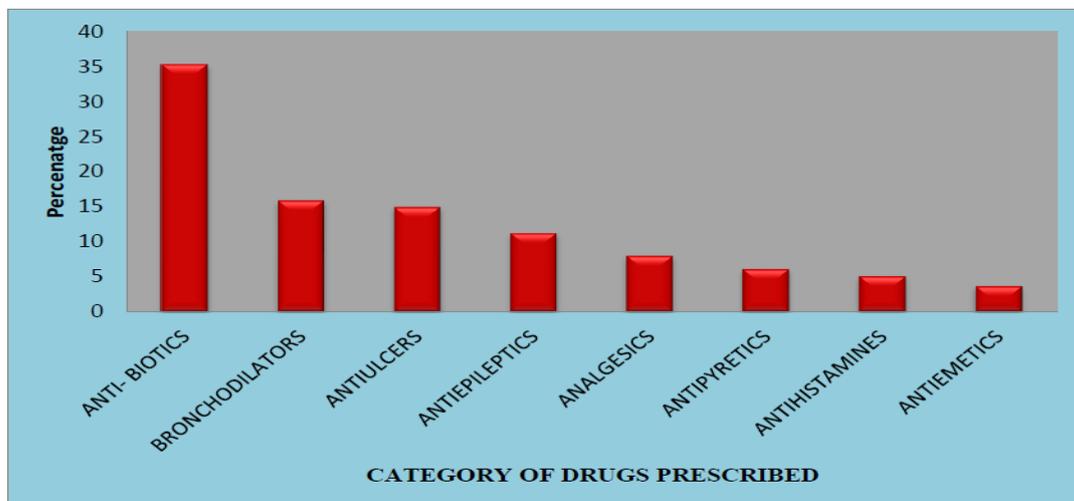


Table 5: Antibiotic Drugs Prescribed.

CLASS OF ANTI BIOTICS	FREQUENCY	PERCENT
CEPHALOSPORINS	96	31.78
BETA LACTUM ANTIBIOTICS	60	19.86
AMINIGLYCOSIDES	46	15.23
POLYPEPTIDE ANTIBIOTICS	38	12.58
QUINOLONES	24	7.94
MACROLIDE ANTIBIOTICS	18	5.96
TETRACYCLINE ANTIBIOTICS	12	3.97
OTHER ANTIBIOTICS	08	2.64
TOTAL	302	100

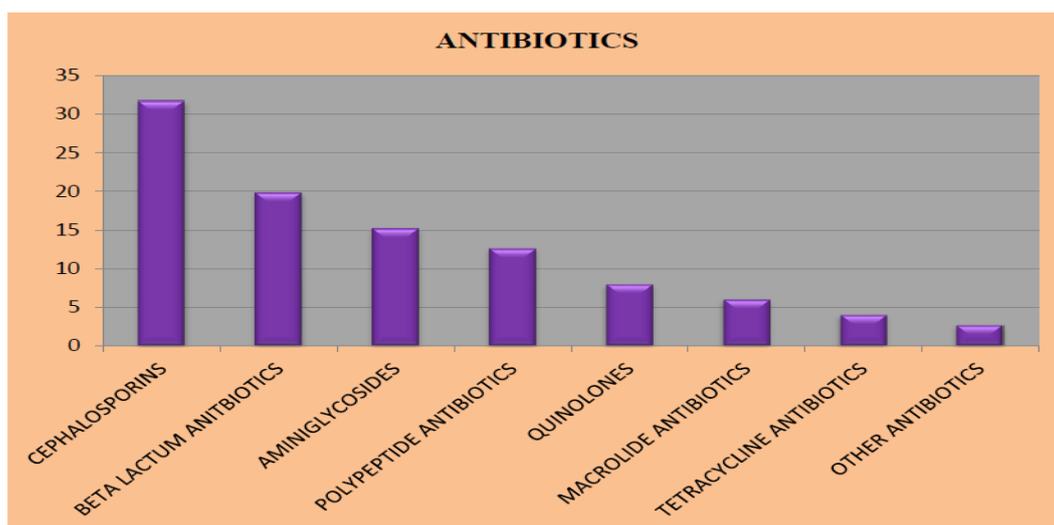


Table 6: Number Of Drugs Per Prescription

NO. OF DRUGS	NO. OF PRESCRIPTIONS
0-2	49
3-5	79
MORE THAN 5	32
TOTAL	160

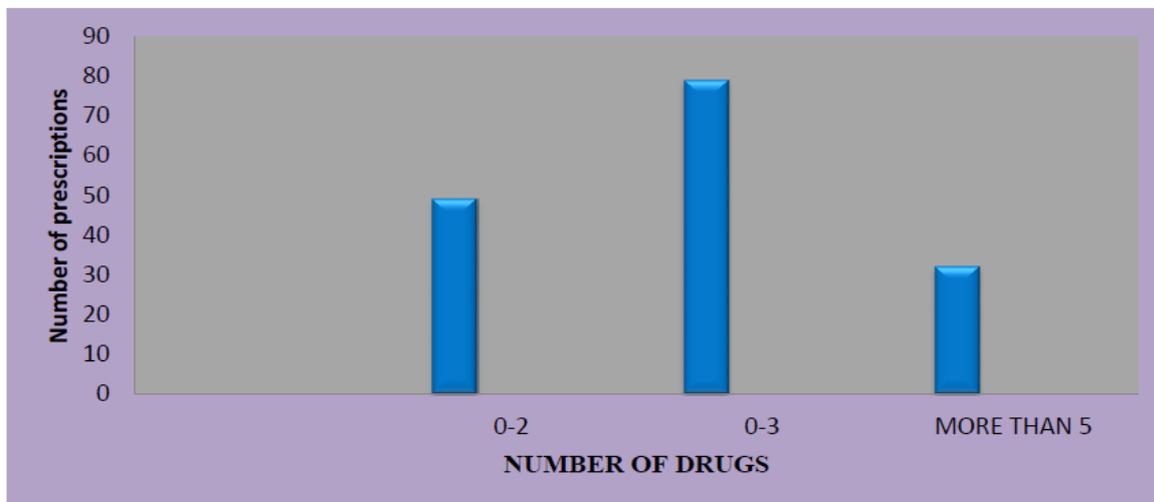


Table 7: ROUTE OF ADMINISTRATION OF DRUGS.

ROUTE OF ADMINISTRATION	FREQUENCY	PERCENT
PARENTERAL	420	49.06
ORAL	280	32.71
INHALATION	80	9.34
SUPPOSITORY	50	5.84
TOPICAL	26	3.03
TOTAL	856	100

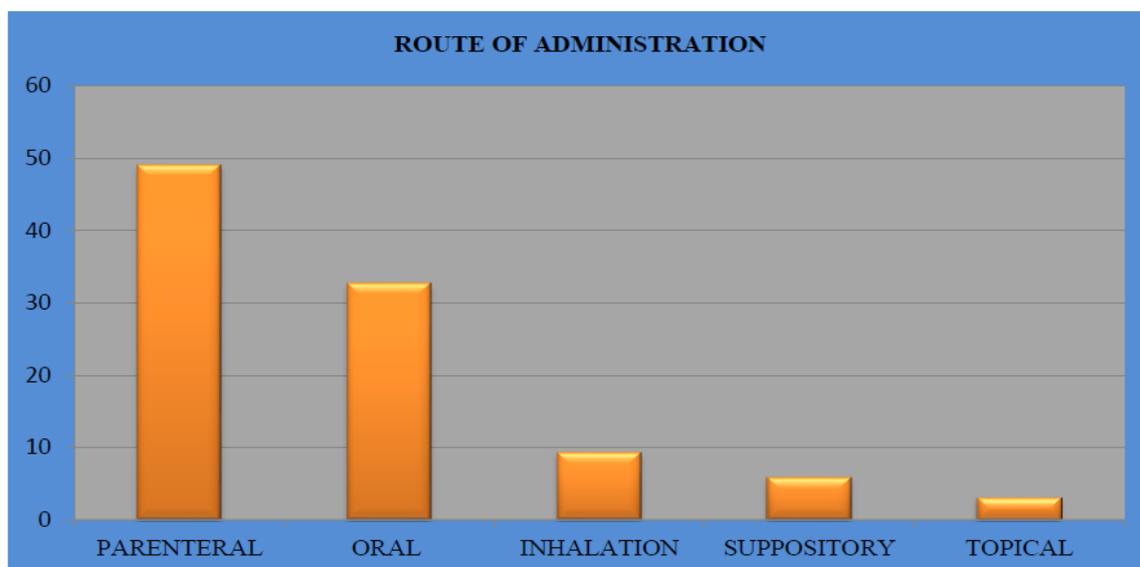


Table 8: Total Number of Drugs Prescribed By Generic Name.

DRUGS	FREQUENCY	PERCENT
GENERIC NAME	224	26.16
BRAND NAME	632	73.83
TOTAL	856	100

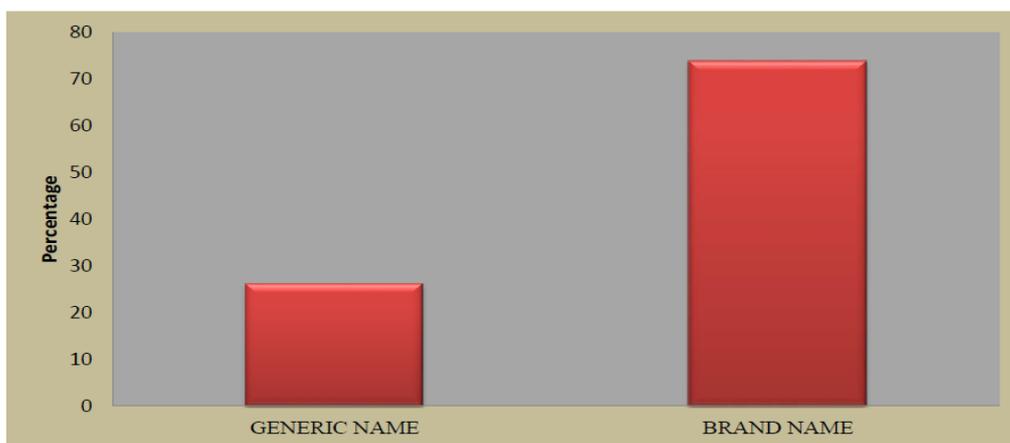


Table 9: Prescribing Indicators.

Prescribing Indicators	NO. OF DRUGS	%	WHO STANDARDS
Average Number Of Drugs Per Encounter	3-5	-	1.6 -1.8
Prescription With Injection Drugs Prescribed	420	49.06	13.4%-24.1%
Prescriptions With Antibiotics Prescribed	302	35.28	20% - 26.8%
Drugs Prescribed By Generic Name	224	26.16	100%
Drugs Included In Essential Drug List	624	72.89	100%

DISCUSSION

A total of 160 pediatric patients were reviewed during the study. The number of male patients (56.25%) were found to be more than the female patients (43.75), similar observations were seen in the study conducted by Bhupalam et al 2017.^[6] Age incidence showed that the peak incidence ranged between the age group of 1 to 3 years (43.75%), same was observed by G. Chandika et al 2019.^[7] This may be due to higher susceptibility of infections at a younger age. The most commonly prescribed drugs in pediatrics were found to be antibiotics (35.28%) followed by bronchodilators (15.88%), antiulcer (14.95%), and antiepileptics (11.21%). The percentage of encounters with antibiotics was 35.28% which is higher than the WHO recommended standard of 20 -26%. Overuse of antibiotics can result in adverse events, drug toxicity and detrimental effects on the gut microbiota, also leads to antimicrobial resistance. The study conducted by Laya Vahdati Rad and Modupalli Alekhya 2015^[8] also showed that antibiotics were the most commonly prescribed drugs in pediatrics. Cephalosporin antibiotics were the most frequently prescribed antibiotic in our study and was similar to the observations made by N. Palikhe 2004.^[9] Cephalosporins were prescribed for a wide variety of infections in pediatrics.

Analysis of routes of administration of drugs revealed that 49.6% were prescribed by the parenteral route and 32.71% were prescribed by oral route. The percentage of drugs prescribed in parenteral route was higher than the WHO recommended standards (13.4 -24.1%) which is comparable to the study conducted by PR Shankar et al 2006.^[10] Increased use of parenteral treatment can lead to a variety of disadvantages including high cost, pain on injection site and cause difficulty in reversing its

physiological effects. Among the diagnosis patterns, gastrointestinal tract disease (28.75%) was the most commonly observed disease in pediatrics followed by LRTI (18.75%). It was similar to the observations made by G Chandika et al 2019 which states that GI diseases in pediatrics could be due to multiple factors like high levels of pollution, use of indoor fuels, inadequate ventilation, overcrowding and infections in our country. In our study we observed that the number of drugs per patient encounter was between the values of 3 to 5, which are higher than WHO prescribed indicator standard value. The WHO standard value for average number of drugs prescribed per patient encounter is 2. It was similar to the previously published studies by Nazima Y Mirza et al 2015.^[11] It is evident that the polypharmacy and overprescribing are common in India. Various reasons can account for this situation like unrealistic expectations and demand for quick relief from the patients, availability of non essential and irrational drug combinations and unethical marketing practices of Pharmaceutical companies.

Our study showed that there was a high trend of using brand names (73.83%) while prescribing than the generic names. Similar observations were seen in study conducted by Harshal N Pise et al 2015.^[12] Percentage of drugs prescribed from generic name was lower than the recommended range of 100% by WHO standards. There is a need to improve prescription pattern by generic name. In our study the percentage of drugs prescribed from the essential drugs list of WHO was 72.89% which was lower than the recommended range of 100% by WHO standards. Similar observations were seen in study conducted by Ajitha Sharma and Oommen Shweta 2016.^[13] Hence continuous medical education with a focus on rational drug use and evidence based medicine

should form part of the program of the hospital.

CONCLUSION

This study gives an overview of the pattern of drugs prescribed in pediatrics and comparison was made with WHO prescribing Indicators. There was noncompliance with the WHO prescribing indicators. The study reveals that effective interventions are required to reduce inappropriate antibiotics prescriptions. Use of parenteral drugs needs to be monitored as excessive use can lead to treatment noncompliance. Prescribing patterns should be improved by prescribing number of medicines as low as possible. Prescribing by generic name and from essential drug list should be strictly implemented. Periodic evaluation of drug use patterns is needed in pediatrics to improve the therapeutic benefits and reduce adverse effects.

BIBLIOGRAPHY

1. M. BiradarS Et al. Assessment of drug utilization patterns in pediatric patients in comparison with WHO core indicators. *GSC Biological and Pharmaceutical Sciences*, 2019; 09(02): 084– 092.
2. Venkateswaramurthy N, Faisal M and kumar RS. Assessment of drug usage patterns in pediatric patients. *Journal of Pharmaceutical Research and Science*, 2017; 9(2): 81-84.
3. Achalu. T and Mensa. M. Drug Use pattern of Antibiotics in Paediatric Ward of Shenan Gibe Hospital, Oromia Region, *Ethiopian Journal of Antibiotics Research*, 2017; 1(1): 1-10.
4. Gortmaker LS et.al. Cost Effectiveness of Childhood Obesity Interventions. *American Journal of Preventive Medicine*, 2015; 49(1): 102–111.
5. Bergicho M, Mohammed AM and Wabe TN. Assessment of the pattern of drug prescribing in paediatrics ward in tertiary setting hospital in Addis Ababa, Ethiopia. *Gaziantep Medical Journal*, 2012; 18(2): 61-65.
6. Bhupalam Pradeepkumar. Assessment of antibiotic prescribing pattern in pediatric patients: A cross-sectional hospital-based survey, *CHRISMED Journal of Health and Research*, 2017; 4(4): 235-237.
7. G. Chandika et al. Assessment of Prescription Pattern in Paediatric Patients Using WHO Indicators. *International Journal of Research and Review*, 2019; (6): 48-52.
8. Laya Vahdati Rad and Modupalli Alekhya. Prescribing Pattern of Antibiotics in Pediatric Inpatient Department of a Tertiary Care Teaching Hospital in Bangalore. *IOSR Journal of Pharmacy and Biological Sciences*, 2015; 10 (4): 26-32.
9. N Palikhe. Prescribing pattern of antibiotics in paediatric hospital of Kathmandu valley. *Kathmandu University Medical Journal*, 2004; 2(1): 6-12.
10. PR Shankar et al. Prescribing patterns among paediatric inpatients in a teaching hospital in western Nepal. *Singapore Medical Journal*, 2006; 47(4): 261-5.
11. Nazima Y Mirza et al. Prescribing pattern in a pediatric out-patient department in Gujarat. *Bangladesh Journal of Pharmacology*, 2009; (4): 39-42.
12. Harshal N Pise. Drug prescribing and dispensing pattern in pediatrics outpatient clinic of a rural tertiary care teaching hospital. *National Journal of Physiology, Pharmacy and Pharmacology*, 2015; 5(4): 313-317.
13. Ajitha Sharma and Oommen Shweta. Assessment of drug prescription pattern in children: a Descriptive study. *National Journal of Physiology, Pharmacy and Pharmacology*, 2016; 6(1): 74-80.