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Research Study

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Clinical Pharmacist Intervention on Paediatric Patients in Tertiary Care Hospital.

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ABSTRACT

In this study used to assess whether the effect of clinical pharmacist intervention on patient education shows a significant difference about the medication's usage is beneficial to patient or not. Adequate knowledge on medication usage helps paediatric patients to prevent disease progression, relieve symptoms, improve health status, prevent and treat complications, reduce mortality. Also assess whether the pharmacist-patient communication makes a significant difference to patient health outcomes. Its useful to find the progress of symptom resolution to normal condition and provide drug information services. Also find out major drug interactions and adverse drug reactions in prescription.

Keywords: Clinical pharmacy, Drug related Problems (DRP's), Paediatrics, Pharmacotherapy, Intervention, Drug therapy.

INTRODUCTION

Paediatrics is the branch of medicine dealing with the development, disease and disorders of children. Most clinical trials for approving medications by the US Food and Drug Administration (FDA) focus on the safety and efficacy of solitary medications in adults. However, data from these trials are often times extrapolated for use in pediatric patients who have different pharmacokinetic processes and physical profiles. Clinical trials that focus on the safety, efficacy, and dosing parameters in pediatric patients are lacking, prompting use of "off-label" prescribing by physicians.^(1,2) With the limited

availability of evidence-based protocols and practice guidelines, clinicians often rely on their best clinical judgment when managing pharmacotherapy for pediatric patients with multiple and/or complex disease states.^(3,4)

Clinical pharmacy services develop and maintain a clinical practice with a patient care service, cooperating with medical and nursing personnel to optimize the pharmacotherapeutic aspects of patient care ⁽⁵⁾. This provides optimal selection of medications, and design of a regimen to maximize therapeutics benefit and minimize toxicity. The physicians prescribe medicines and the pharmacist checks the prescription to ensure rational use of drugs.

They check whether there is an indication for the drug, is it the right drug/dose/duration/dosage/time, etc. If there is any deviation from these, they make appropriate interventions, inform the prescriber and document the interventions ⁽⁶⁾.

Drug therapy is the major problem facing in the management of disease in paediatric patients. It makes challenges for paediatrician during the prescribing of medicines as per the disease of patients especially for antibiotics. Children are particularly susceptible to drug related problem (DRP) as they vary in weight, body surface area and organ maturity which can affect their ability to metabolize and excrete medications effectively.

Procedure

- This is a prospective interventional and observational study, where eligible patients are enrolled in to the study after obtaining the consent.
- The patient information is gathered by data collection form.. This form mainly contains the demographic details of the patient, chief complaints, lab history and medication chart.
- The obtained information is used for identification of drug related problems like drug-drug interactions assessed by using Drug interaction probability scale (DIPS), Naranjo scale for estimating the probability of suspected adverse drug reaction (ADR) and to evaluate patient knowledge on their medication by using Garcia Delgado questionnaire.

- Sampling of subjects was done alternatively into interventional group and control group.
- Patient counselling was provided to interventional group about their medication and needed life style modifications.
- Regular follow up was made to monitor the days of hospital stay, before being discharged.
- Patient knowledge on their medication was measured by using Garcia Delgado questionnaire 11 items for intervention group before and after providing patient education about their medication and control group without providing any information about medications.
- Days took to recover for both control and test groups are compared by considering their date of admission and date of discharge.
- Our overall goal is to minimize the risk of treatment induced problems and maximize the clinical effect of medicines.

RESULTS

AGE WISE DISTRIBUTION

Totally 80 paediatric patients were included in the study, which were from 2months – 11years age group. Out of which, 22.5% were in the age group of 2M-10M and 11M-2Y, followed by 20% of patients from age group 9y-11y, 17.5% in 3Y-5Y and 6Y-8Y age group. In 80 enrolled patients, samples were divided alternatively into control group and test group. The mean and standard deviation of age was 4.53 ± 3.86.

Table 1: Age wise distribution in study population

S. No	Age Group	No. Of Patients (N=80)	Control (N=40)	Test (N=40)
1.	2months-10months	18 (22.5%)	12 (30%)	6 (15%)
2.	11months-2years	18 (22.5%)	8 (20%)	10 (25%)
3.	3years-5years	14 (17.5%)	3 (7.5%)	11 (27.5%)
4.	6years-8years	14 (17.5%)	12 (30%)	2 (5%)
5.	9years-11years	16 (20%)	5 (12.5%)	11 (27.5%)

GENDER WISE DISTRIBUTION

Among 80 enrolled cases, 63.75% were of males and 36.25% were females. Males are predominant

over females. In test group males and females were 57.5% and 42.5% respectively whereas in control group males were 70% and 12 females were 30%.

Table 2: Gender wise distribution in study population

S.No	Gender	No. Of Patients (N=80)	Control (N=40)	Test (N=40)
1.	Male	51 (63.75%)	28(70%)	23(57.5%)
2.	Female	29 (36.25%)	12(30%)	17(42.5%)

ECONOMICAL STATUS DISTRIBUTION

According to economical status of patient, intermediate class 48.75% people were highly affected

with various ailments than poor (42.5%) and rich (8.75%) class patients.

Table 3: Economical status distribution in study population

S.No	Economical Status	No. Of Patients (N=80)	Control (N=40)	Test (N=40)
1.	Poor	34 (42.5%)	19(47.5%)	15(37.5%)
2.	Intermediate	39 (48.75%)	17(42.5%)	22(55%)
3.	Rich	7 (8.75%)	4(10%)	3(7.5%)

MEDICAL DIAGNOSIS FOUND IN PAEDIATRIC WARD

A total of 106 cases were observed during our study period, in them 80 cases were recorded with respect to inclusion criteria. Among all 22.5% cases were diagnosed as lower respiratory tract infection and ranked as one in our observational study, followed by

11.25% acute gastroenteritis, 8.75% cases of anemia, fever, febrile seizures, meningitis, 5% of nephrotic syndrome and juvenile diabetes, 3.75% of amoebic dysentery, 2.5% cases of Dengue, Malaria, Rheumatic fever and 1.25% of Jaundice, scorpion sting, SLE, Tuberculosis, UTI and ranked as seventh place.

Table 4: Ranking of medical diagnosis based on Percentage

S.No	Medical Diagnosis	No. Of Cases (N=80)	Ranking	Control (N=40)	Test (N=40)
1	Acute gastroenteritis	9	2	4	5
2	Amoebic dysentery	3	5	2	1
3	Anaemia	7	3	3	4
4	Dengue	2	6	2	0
5	Fever	7	3	4	3
6	Febrile seizures	7	3	2	5
7	Jaundice	1	7	0	31
8	LRTI	18	1	11	7
9	Lymphadenopathy	3	5	2	1
10	Malaria	2	6	1	1
11	Meningitis	7	3	1	6
12	Nephrotic syndrome	4	4	4	0
13	Rheumatic fever	2	6	1	1
14	Scorpion sting	1	7	1	0
15	Systemic lupus erythromatus	1	7	1	0
16	Tuberculosis	1	7	0	1
17	Type 1 diabetes	4	4	1	3
18	Urinary tract infection	1	7	1	0

It is inferred that lower respiratory tract infection is the common ailment in children. Rarely reported diseases were SLE, TB, UTI and jaundice in view of our analysis.

DISTRIBUTION OF DEGREE OF KNOWLEDGE FOR EACH OF THE PKM QUESTION IN STUDY POPULATION

The percentage of knowledge for each question of Garcio-Delgado questionnaire was obtained from control and test group (after providing information about the drug chart) is as follows: In control group, 65% of patients have

accurate knowledge about the form of administration followed by 52.5% about the regimen, duration of treatment 50%, indication 42.5%, Conservation 37.5%, Dose 32.5%, precautions 7.5%, Contraindication 5%, Side effect and indicators of effectiveness 2.5%. No patient is having knowledge about the interactions.

Table 5: Distribution of degree of knowledge for each of the PKM question in control group

Questions	Incorrect Knowledge (-1)	Does Not Know (0)	Insufficient Knowledge (1)	Correct (2)
P.1.Indication	1 (2.5%)	8 (20%)	14 (30%)	17 (42.5%)
P.2.Dose	3 (7.5%)	11 (27.5%)	13 (32.5%)	13 (32.5%)
P.3.Regimen	2 (5%)	5 12.5(%)	12 (30%)	21 (52.5%)
P.4. Duration of treatment	4 (10%)	8 (20%)	8 (20%)	20(50%)
P.5.Form of administration	2 (5%)	2 (5%)	10 (25%)	26 (65%)
P.6.Precautions	3 (7.5%)	30 (75%)	4 (10%)	3 (7.5%)
P.7. Side effect	4 (10%)	31 (77.5%)	4 (10%)	1 (2.5%)
P.8.Contraindications	2 (5%)	34 (85%)	2 (5%)	2 (5%)
P.9. Indicators of effectiveness	7 (17.5%)	22 (55%)	10 (25%)	1 (2.5%)
P.10. Interactions	2 (5%)	38 (95%)	0 (0%)	0 (0%)
P.11.Conservation	1 (2.5%)	9 (22.5%)	15 (37.5%)	15 (37.5%)

In test group, 95% of patients have correct knowledge about the dose followed by 92.5% of patients correctly answered about the indication, regimen and conservation, 90% about duration of treatment, 80% about form of administration, 35% about precautions and indicators of effectiveness, 17.5% of about side effects and interactions and 12.5% about the contraindications.

Table 6: Distribution of degree of knowledge for each of the pkm question in test group

Questions	Incorrect Knowledge (-1)	Does Not Know (0)	Insufficient Knowledge (1)	Correct (2)
P.1.Indication	0 (0%)	0 (0%)	3 (7.5%)	37 (92.5%)
P.2.Dose	0 (0%)	0 (0%)	2 (5%)	38 (95%)
P.3.Regimen	0 (0%)	0 (0%)	3 (7.5%)	37 (92.5%)
P.4. Duration of treatment	0 (0%)	0 (0%)	4 (10%)	36 (90%)
P.5.Form of administration	0 (0%)	0 (0%)	8 (20%)	32 (80%)
P.6.Precautions	0 (0%)	5 (12.5%)	21 (52.5%)	14 (35%)
P.7.Side effect	0 (0%)	9 (22.5%)	24 (60%)	7 (17.5%)
P.8. Contraindications	2 (5%)	12 (30%)	21 (52.5%)	5 (12.5%)
P.9. Indicators of effectiveness	0 (0%)	7 (17.5%)	19 (47.5%)	14 (35%)
P.10. Interactions	0 (0%)	16 (40%)	17 (42.5%)	7 (17.5%)
P.11.Conservation	0 (0%)	0 (0%)	3 (7.5%)	37 (92.5%)

DISTRIBUTION OF PKM SCORES IN CONTROL GROUP BASED ON GARCIO-DELGADO QUESTIONNAIRE

Sample grouping was alternatively into control group and test group. Patient knowledge on their medication was known by using Garcio Delgado questionnaire among 40

patients of control group initially. No intervention was provided to this group. Again scoring was obtained, to understand any improvement in patient knowledge those who may acquire information by their own search or knowing from any other personnel about the medication importance.

Table 7: Distribution of Patient knowledge on medication based on Garcio- Delgado questionnaire in control group

CONTROL GROUP	DNKM	ISK	SK	OK
Initial	13(32.5%)	23 (57.5%)	3(7.5%)	1(2.5%)
After	11(27.5%)	21(52.5%)	6(15%)	2(5.0%)

DISTRIBUTION OF PKM SCORES IN TEST GROUP BASED ON GARCIO- DELGADO QUESTIONNAIRE

Intervention was provided to this group about the medication usage and their importance for adherence.

Initially, without giving any educational intervention, score was obtained from them. Later scoring was taken to analyze the level of understanding of patient about the clinical pharmacist provided information.

Table 8: Distribution of Patient knowledge on medication based on Garcio-Delgado questionnaire in Test group

Test Group	DNKM	ISK	SK	OK
Before counseling	27(67.5%)	7 (17.5%)	4(10%)	2(5%)
After counseling	0(0%)	2(5%)	22(55%)	16(40%)

COMPARISON OF PKM SCORES BETWEEN CONTROL AND TEST GROUP BY STASTICAL METHOD: ONE WAY – ANALYSIS OF VARIANCE

The Control group compared with test group before and after counseling by ANOVA one way statistics using

Dunnetts comparative test, no significance was found in between control group and test group before counseling and high significance of $P < 0.0001$ i.e. 95% significance was found between PKM score of control and PKM value of test after counseling. This indicates that the counseling intervention made by pharmacist was effective.

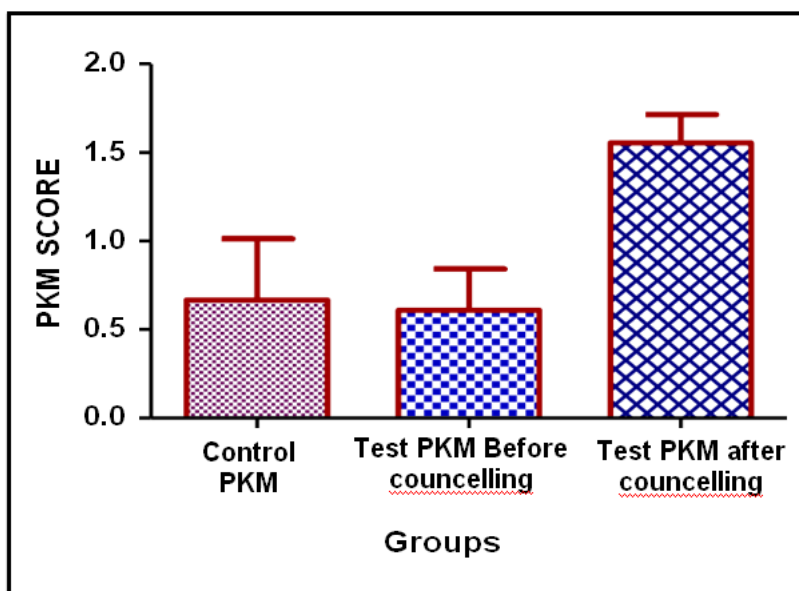


Fig 1: Comparison of PKM score in control and test group.

Table 9: Statistical Data

Category	Control	Test Before Counselling	Test After Counselling
No. OF CASES	40	40	40
Mean	0.667	0.61	1.55
Median	0.67	0.63	1.56
SD	0.345	0.232	0.161

SEM	0.0545	0.0368	0.0254
Level of significance	0.05		
Confidence interval	95%		
P- value	Ns	ns	<0.0001
Lower 95% CI	0.557	0.535	1.5
Upper 95% CI	0.778	0.684	1.61
CONTROL PKM SCORE Vs TEST BEFORE – No significance.			
CONTROL PKM Vs TEST AFTER – Extremely significance.			

COMPARISON OF DAYS OF HOSPITALIZATION IN STUDY POPULATION

In test group, ≤ 3 days of hospital stay was found in 52.5% of patients, 4-6 days of hospital stay was found in 35% of patient's and 7-10 days of hospital stay was found in 12.5% of patients. The mean and standard deviation of duration of hospital stay was 4.76±1.95 days. In control group, ≤ 3 days of hospital stay was found in 20% of

patients, 4-6 days of hospital stay was found in 57.5% of patients and 7-10 days of hospital stay was found in 22.5%. When comparing the days of hospital stay between the test and control group, it was found that 21 patients are discharged in ≤ 3 days in test group and 8 patients in control group. It shows that adherence to medication chart helps to reduce length of hospital stay.

Table 10: Comparison of days of hospitalization between control and test groups

Group	Total Patients	≤ 3 days	4-6 days	7-10days
Control	40	8 (20%)	23 (57.5%)	9 (22.5%)
Test	40	21 (52.5%)	14 (35%)	5 (12.5%)

TYPES OF CLINICAL PHARMACY SERVICES PROVIDED

A total of 93 clinical pharmacy services were

provided. Out of which highest services provided was patient counselling 86.02% followed by ADRs 7.52% and drug information services 6.45%.

Table 11: Types and No. of clinical pharmacy services provided

S.No	Clinical Pharmacy Service	No. Of Provided (N=53)	Percentage (%)
1	Patient counselling	40	75.47
2	Drug information services	6	11.32
3	Adverse drug reaction identified	7	13.20

PATIENT COUNSELLING

Patient counseling was provided to all 40 reported cases of test group about the medication usage and non-pharmacological therapy.

CATEGORIGATION OF DRUG INFORMATION SERVICES

Total 6 drug information services were provided. Among them 33.33% were related to drug therapy and 16.66% were related to Dose administration, ADRs, Indication and route of administration.

Table 12: Types and no. of drug information services provided

S.No	Category of Query	No. of Queries (N=6)	Percentage (%)
1.	Drug therapy	2	33.33
2.	Dose administration	1	16.66
3.	ADRs	1	16.66

4.	Indication	1	16.66
5.	Route of administration	1	16.66

ADVERSE DRUG REACTIONS IDENTIFIED

Out of 93 clinical pharmacy services were provided, 8 were identified as ADRs. In them 28.57% is caused by Amoxicillin+ Clavulanic acid followed 14.28% of Adrs are caused by Methotrexate, Prednisolon, Amikacin, Ceftriaxone and Pencillin.

Table 13: Name of the drug caused ADR and no. of identified.

S.No	Drug Name	Adr	No. Of Cases Identified(N=7)	Percentage (%)
1.	Amoxicillin+ Clavulanic acid	Pruritis	2	28.57
2.	Methotrexate	Pruritis	1	14.28
3.	Prednisolon	Facial puffiness	1	14.28
4.	Amikacin	Respiratory distress	1	14.28
5.	Ceftriaxone	Diarrhoea	1	14.28
6.	Pencillin	Steven Johnson Syndrome	1	14.28

Table 14: Probability of suspected ADR assessed by using Naranjo's scale

Drug Name	Score	Probability
Amoxicillin+Clavulanic acid	10	Definite
Methotrexate	10	Definite
Prednisolon	5	Possible
Amikacin	6	Possible
Ceftriaxone	5	Possible
Pencillin	10	Definite

IDENTIFIED DRUG RELATED PROBLEMS IN STUDY POPULATION

Totally 96 DRP's were identified. In that the most common type of drug related problem was drug- drug interaction which was found to be 39.58% followed by

untreated indications (14.58%), drug used without indication and wrong dose errors (10.41%), less dose of prescribing and adverse drug reactions (8.33%), dispensing errors (7.29%) and finally high dose was found to be (1.04%) which was less frequently occurred.

Table 15: Types of drug related problems identified

S.No	Type Of Drp's	No. Of Identified (N=96)	Percentage (%)
1.	Adverse drug reactions	8	8.33
2.	Untreated indications	14	14.58
3.	Drugs used without indication	10	10.41
4.	Wrong dose errors	10	10.41
5.	Dispensing errors	7	7.29
6.	Less dose	8	8.33
7.	Drug interactions	38	39.58
8.	High dose	1	1.04

SEVERITY OF DRUG INTERACTIONS

Drug interactions were not presented by patients on their experience, but identified by clinical pharmacist and informed to patient to have knowledge about the interactions. Out of 27 drug- drug interactions, 92.59% are moderate and 7.40% are minor. 11 drug- food interactions

were found. Few examples of drug-drug interaction identified in the study involve drug interaction between phenytoin with acetaminophen, food, ranitidine, lorazepam, acyclovir and other interaction like ceftriaxone with amikacin together may increase the risk of nephrotoxicity.

Table 16: Type, severity and No. of drug interactions found

S.No	Severity Of Drug- Drug Intercaction	No. Of Drug Interactions Found (N= 27)	Percentage (%)
1	MAJOR	0	
2	MODERATE	25	92.59
3	MINOR	2	7.40
DRUG- FOOD INTERCATIONS: 11			

THERAPEUTIC CLASS OF DRUGS OBSERVED IN STUDY POPULATION

Totally 24 therapeutic classes of drugs were prescribed to study population.

Table 17: Prescribing pattern of drugs in study population.

S.No	Therapeutic Class	No. Of Drugs (N=99)	Percentage (%)
1.	Antibiotics	22	22.22
2.	Analgesics&antipyretic	4	4.04
3.	Anticonvulsants	10	10.10
4.	Antidiarroheals	4	4.04
5.	Antiemetics	3	3.03
6.	Cough suppressants	5	5.05
7.	Steroids	5	5.05
8.	NSAIDs	2	2.02
9.	Diuretics	2	2.02
10.	PPI	3	3.03
11.	H ₂ receptor antagonist	2	2.02
12.	DMARD's	1	1.01
13.	Ca ⁺² channel blocker	1	1.01
14.	Insulin analogues	5	5.05
15.	Antimalarials	3	3.03
16.	Bronchodilators	11	11.11
17.	Antifungal	1	1.01
18.	Antihistamine	1	1.01
19.	Antiviral	1	1.01
20.	Antiprotozoal	3	3.03
21.	Vitamins	6	6.06
22.	Nasoclear	2	2.02
23.	Laxatives	1	1.01
24.	ORS	1	1.01

Among them 22.22% of antibiotics were most frequently used in paediatric department followed by bronchodilators 11.11%, anticonvulsants 10.10% and vitamins 6.06%.

TYPES OF FORMULATION PRESCRIBED

In Paediatric department, 39.71% of injections were prescribed followed by syrups 25.05%, tablets 16.54%, suppositories 13%, nebulizer 6.61%, others 5.43%, and drops 3.54%.

Table 18: Types of formulation prescribed

S.No	Formulation	No. Of Prescribed (N=423)	Control (N=244)	Test (N=179)
1	INJECTIONS	168 (39.71%)	83 (34.01%)	85 (47.48%)
2	SYRUPS	106 (25.05%)	58 (23.77%)	48 (26.81%)
3	TABLETS	70 (16.54%)	54 (22.13%)	16 (8.93%)
4	NEBULIZATION	28 (6.619%)	18 (7.37%)	10 (5.58%)
5	DROPS	15 (3.54%)	8 (3.27%)	7 (3.91%)
6	SUPPOSITORIES	13 (13%)	8 (3.27%)	5 (2.79%)
7	OTHERS	23 (5.437%)	15 (6.14%)	8 (4.46%)

NUMBER OF MEDICATIONS PRESCRIBED PER PATIENT DURING HOSPITALISATION

Among 80 paediatric patients, 56.25% of patients received 5-8 medications, 40% received 1-4 drugs and 3.75% patients received ≥ 9 medications. The mean and standard deviation of number of drugs given was 5.28 ± 1.86 .

Table 18: Number of medications prescribed per patient:

S.No	No. Of Medications	No. Of Patients (N=80)	Control (N=40)	Test (N=40)
1	1-4	32 (40%)	16 (40%)	16 (40%)
2	5-8	45 (56.25%)	21 (52.5%)	24 (60%)
3	≥ 9	3 (3.75%)	3 (7.5%)	0 (0%)

DISCUSSION

A total of 80 patients were included in the study based on the inclusion and exclusion criteria out of which 40 were considered under control group and another 40 were considered as test group. Present demographic study showed that 51 patients were males (63.75%) and 29 female patients (36.25%) were admitted in pediatric ward with various ailments. The study showed that, patients in age group of (2months – 10months) and (11months – 2years) were mainly affected with various diseases equally i.e., 22.5%. Similar report was found in the study of Ragesh. G et.al. ⁽⁷⁾

In test group, before counseling more number of people were found in DNKM category i.e., 27(67.5%) and 2(5%) people were in OK category, whereas after counseling highest number of people were falls in OK category i.e., (16) 40% and in DNKM category none number of people exist. This indicates that the patient's guardians were familiar with medication usage and their details. It is similar to the study of Joaquín Salmerón Rubio et.al⁽⁸⁾.

In test group there were 17 patients stayed in hospital

for ≤ 3 days, 18 patients stayed for 4-6days and 5 patients were stayed for 7-10days where as in control group only 8 patients stayed for ≤ 3 days, 26 patients stayed for 4-6 days and 6 were stayed for 7-10 days.

The study population who were affected with the most common disease was found to be lower respiratory tract infections i.e. 18 (22.5%) followed by acute gastroenteritis 9 (11.25%) and then equal number of cases of meningitis, febrile seizures, anemia i.e. 7. 5% of nephrotic syndrome and juvenile diabetes, 3.75% of amoebic dysentery, 2.5% cases of Dengue, Malaria, Rheumatic fever and 1.25% of Jaundice, scorpion sting, SLE, Tuberculosis, UTI. It is similar to Binila jose et.al. ⁽⁹⁾

The most common types of drug related problem was drug interaction (39.58%) followed by untreated indications (14.58%), drug used without indication and wrong dose errors (10.41%), low dose of prescribing and adverse drug reactions (8.33%), dispensing errors (7.29%) and finally high dose (1.04%). The number of drugs prescribed per patients during the hospital stay was analyzed. The patient's taken 1-4 drugs (56.25%) were more common when correlate with others. Others patients taken drugs

40% of patients received in between 5-8 drugs and 3.75% of patients received ≥ 4 drugs. These results were contrast to the prospective study conducted by Binila jose et.al, in their study incorrect dose was the most common drug related problem identified ⁽⁹⁾.

In our study drug interaction is the highest incidence of drug related problem, Among 27 drug interactions (92.59%) were moderate and 7.40% were minor interactions and 11 drug-food interactions were also found, detected and reported to patient. Few examples of drug-drug interaction identified in the study involve drug interaction between phenytoin with acetaminophen, food, ranitidine, lorazepam, acyclovir and other interaction like ceftriaxone with amikacin together may increase the risk of nephrotoxicity. According to spriet et al., an important interaction occurs when patients are treated with meropenem and valproate ⁽¹⁰⁾.

Out of 53 clinical pharmacy services were provided. Among them highest services provided was patient counselling 75.47% followed by ADRs 11.32% and drug information services was 13.20%. It is similar to the study of Ragesh et.al were they provided 85.89% of patient counseling services and 8.97% of drug information services and 3.20% were ADRs ⁽⁷⁾. Mihirkumar p. et al. showed that patient counseling done by Pharm D students affects the quality of life and had a positive impact in patients ⁽¹¹⁾. Seven adverse drug reactions were observed. In them the frequency and number of ADRs are resulted from Amoxicillin + Clavulonic acid. It is similar to study of Mallesh mandha et al., in which frequency and the number of ADRS resulted same from antibiotics ⁽¹²⁾.

Among 6 drug information 33.33% of DI queries were related to drug therapy and equal percentage of i.e. 16.66% of DI queries related to dose administration, ADR'S, indication and route of administration. DIS helped healthcare professionals in better care of patient, safe and effective drug usage and updating their knowledge. It was contrast to the study of Mahendra Kumar BJ et.al. ⁽¹³⁾

The prescribing pattern of drugs in the present study population was identified. Twenty four therapeutic classes of drugs were prescribed to paediatrics. Totally 99 drugs were prescribed to 80 patients. Among them 22.22% of antibiotics were most frequently used in paediatric department followed by bronchodilators 11.11%, anticonvulsants 10.10%, vitamins 6.06%, cough suppressants, steroids and insulin analogues were 5.05%, analgesic & antipyretic and antidiarrhoeal 4.04%, antiemetic, PPI and antimalarials were 3.03%, NSAIDS, diuretics and H₂ receptor antagonist were 2.02%. Less frequently prescribed class of drugs are DMARDs, Calcium channel blockers, antifungal, antihistamine, antiviral, Laxatives and ORS were 1.01%.

CONCLUSION

Overall the study concludes that clinical pharmacists play a key role in the patient safety intercepting and acting against on possible prescribing errors. Drug related problems were identified it was not harmful to the patient. The participation of clinical pharmacists in pharmacotherapy of pediatric patients can reduce length of hospital stay of patients with diseases and improve compliance rate through discharge education.

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