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PROFILE OF PEDIATRIC PATIENTS VISITING THE EMERGENCY DEPARTMENT AT A TERTIARY CARE TEACHING HOSPITAL IN SOUTH INDIA

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ABSTRACT: Background: Understanding the dynamic profiling of emergency department (ED) visits, particularly among pediatric patients, is crucial for implementing targeted interventions to enhance outcomes and optimize triage systems for this vulnerable population. **Aim and Objective:** This study aimed to profile the demographics, clinical presentations, and treatments of pediatric patients admitted to the ED**. Materials and Methods**: Conducted as a prospective observational study over six months in South India, this research included 110 participants. Sociodemographic and clinical data were collected and analyzed using IBM SPSS software version 29.0. **Results:** The male-to-female ratio among participants was 1.2:1, with children aged 1 to 10 constituting 48.1% of the cohort. Febrile seizures emerged as the most common diagnosis, accounting for 17.3% of cases. Acetaminophen was the most frequently prescribed medication, used by 30.0% on admission and 12.7% upon discharge. Drug-drug interactions (DDI) were significant, with 92.7% classified as moderate and 7.3% as severe. The mean length of hospital stay was approximately four days, and polypharmacy was noted in 52.8% of patients. **Conclusion:** The predominance of febrile seizures and high rates of polypharmacy and DDI highlight the need for clinical pharmacist involvement in the ED. Such engagement could enhance patient education, minimize the recurrence of seizures, and reduce the risk of adverse drug interactions, ultimately improving pediatric emergency care.

INTRODUCTION: The emergency department (ED) serves as the public's primary point of contact for emergency health care. With the rising complexity of healthcare systems and the growing need for ED services, it is critical to track and understand annual patterns in the ED to improve emergency care, readiness, and management [1].

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Even though the prevalence of emergency diseases is significant in many low- and middle-income countries (LMIC), this concern is disregarded there [2]. Because of insufficient medical records, a lack of national data, and the impossibility of conducting studies in some institutions, there is a shortage of fundamental information and national surveillance data on emergency treatment in LMICs.

The lack of such elements has a detrimental impact on training initiatives, patient treatment, policymaking, and distribution of resources [3]. The involvement of pediatric patients in decision-making processes is becoming increasingly important in the healthcare system [4].

Managing the communicable requires an understanding of the special characteristics of young patients, such as their underdeveloped immune systems and distinct developing enzymatic and receptor systems [5].

Given the shortage of evidence-based pharmacotherapeutics specifically designed for the pediatric population, it is imperative to comprehend the pharmacokinetics and pharmacodynamics of medicines in children to ensure safe and effective therapy [6]. Children under the age of 18 account for over 35% of all ED visits worldwide each year, with around 15 out of every 100 children entering the ED at least once [7]. More than 40% of pediatric ED visits involved children under the age of five [8].

The pattern of ED visits has fluctuated depending on the patient's characteristics and the condition [9]. Injuries and poisoning account for the majority of ED visits among children, followed by respiratory problems, problems with the nervous system, infectious conditions, and non-urgent ailments [10]. Variations in socioeconomic conditions, insurance coverage, the healthcare system, and access to care are some of the factors that influence ED visits over time [11, 12].

These findings imply that understanding the dynamic profiling of ED visits, particularly in pediatric patients, is essential for implementing targeted interventions, improving outcomes for this vulnerable population, and improving triage systems to optimize pediatric emergency care. The current study aimed to characterize the demographics, clinical presentation, and treatment of pediatric patients who visited the ED of a tertiary care teaching hospital, taking into account the aforementioned circumstances.

MATERIALS AND METHODS: This prospective observational study was carried out for six months at the Department of Emergency Medicine, Sri Ramachandra Institute of Higher Education and Research (DU), South India. The sample size was determined based on the 7.3% overall prevalence of ED admissions [13].

With a power of 80, a confidence interval of 95%, and a 10% attrition rate, the sample size of 110 was computed using the Epi software 2.13 version. The scientific committee of the Sri Ramachandra Institute of Higher Education and Research (DU) (Ref No. SRC/398/2024) and the ethical committee (Ref No. EC/AP/1122/02/2024) both accepted the study protocol.

The study included all patients, both gender, admitted to the ED and under the age of eighteen. This study did not include patients who were older than eighteen or who had previously had pre-hospitalized cardiopulmonary resuscitation. The study only included participants who had previously signed an informed permission form by the patient's caregiver.

The data collected from the patient data collection form and cash reports included the following details: patient age, gender, diagnosis, major complaints, co-morbidities, length of stay in intensive care units (ICUs), length of stay (LOS) in the hospital, and in-hospital mortality.

Patients were monitored until they received discharge from the hospital or died. The time interval between the patient's admission and discharge from the hospital is known as the length of stay (LOS).

Statistical Analysis: The statistical package for the social science (SPSS) Statistics for Windows, Version 16.0 (IBM Corp, Armonk, NY), was used to analyze the data gathered. For categorical variables, frequency analysis and percentage analysis were employed to characterize the data, whereas mean and S.D. were utilized for continuous variables.

RESULTS: During the study's period, 110 pediatric patients admitted to the emergency department were enrolled and studied from admission to discharge. **Table 1** displays the study population's demographic information. The study had male predominance (55.5%). Although there were more males than females, females outnumbered males in the adolescent group.

The overall male- female ratio was 1.2:1. The study participants' ages ranged from 0 to 17 years. Children (1-10 years) constituted 48.1% of the population, with adolescents (11-17 years) accounting for 25.45%. Most of the study population (43.6%) had a socioeconomic status of class III.

TABLE 1: THE DEMOGRAPHICAL DATA OF THE PATIENTS

Categories	Frequency (n=110)	Percentage(%)
Gender		
Male	61	55.5
Female	49	45.5
Age Distribution		
Neonates (0-4 weeks)	2	1.8
Infants (5 weeks - 1 years)	27	24.5
Children (2 - 10 years)	53	48.2
Adolescents (11 – 17 years)	28	25.5
Age-gender relationship		
Neonates		
Male	0	0
Female	2	1.8
Infants		
Male	19	17.3
Female	18	16.4
Children		
Male	31	28.2
Female	22	20.0
Adolescents		
Male	11	10.0
Female	17	15.5
Socioeconomic Status		
Class-II	43	39.1
Class-III	48	43.6
Class-IV	19	17.3

Table 2 lists the clinical characteristics of the study participants at the time of admission. The most prevalent complaints among patients were vomiting (35.5%), fever (29.1%), and seizure (30.0%). Facial puffiness was the least prevalent (3.6%). The majority of the patients' diagnoses were febrile seizures (17.3%), with the least prevalent being nephrotic syndrome (3.6%), diarrhea (3.6%), and asthma (3.6%).

Neurological emergencies accounted for the highest diagnoses (36.3%), followed by respiratory emergencies (19.1%). Cardiovascular, endocrine, and musculoskeletal system problems were the least prevalent. 30.9% of the study population had a significant medical history, with respiratory problems (11.8%) being the most common, followed by a history of febrile seizures (10.9%).

TABLE 2: CLINICAL CHARACTERISTICS OF PATIENTS ON ADMISSION

Characteristics	Frequency (n=110)	Percentage (%)
Common chief complaints on admission		
Vomiting	39	35.5
Fever	32	29.1
Seizure	33	30.0
Cough	32	29.1
Cold	18	16.4
Fever with chills and rigors	17	15.5
Abdominal pain	15	13.6
Diarrhoea	14	12.7
Headache	12	10.9
Breathing difficulty	9	8.2
Foreign body ingestion	5	4.5
Giddiness	4	3.6
Facial puffiness	4	3.6
Final Diagnosis		
Febrile seizure	19	17.3
Seizure	9	8.2
Dengue	8	7.3

Unprovoked seizure	6	5.5
Anemia	6	5.5
Other seizures	5	4.5
Urinary Tract Infections	5	4.5
Viral Fever	5	4.5
Diarrhoea	4	3.6
Asthma	4	3.6
Nephrotic Syndrome	4	3.6
Systemic Distribution of the clinical symptoms		
Central Nervous System	40	36.3
Respiratory system	21	19.1
Gastro-intestinal system	13	11.8
Genito-urinary system	14	12.7
Systemic system	9	8.1
Hematological system	9	8.1
Dengue	8	7.2
Foreign body ingestion	6	5.4
Cardio-vascular system	2	1.8
Burns	2	1.8
Endocrine system	1	0.9
Musculoskeletal system	1	0.9
Past Medical History		
None	76	69.1
Respiratory disorder	13	11.8
Febrile seizure	12	10.9
Others	9	8.2

Table 3 is a list of the medications recommended and the method of administration during admission. The most often prescribed medications among the patients were acetaminophen (30.0%), ranitidine (24.5%), and ondansetron (18.2%), whereas the least frequently prescribed medications were azithromycin (4.5%) and sodium valproate (4.5%). Most of the patients included were treated via the intravenous route (49.1%), with the topical route accounting for only 1.2%.

TABLE 3: DRUGS PRESCRIBED AND ROUTE OF ADMINISTRATION DURING ADMISSION

Characteristics	Frequency (n=110)	Percentage (%)
Drugs Prescribed		
Acetaminophen	33	30.0
Ranitidine	27	24.5
Ondansetron	20	18.2
Ceftriaxone	19	17.3
Salbutamol	15	13.6
Pantoprazole	14	12.7
Phenytoin	14	12.7
Levetiracetam	12	10.9
Clobazam	11	10.0
Ipratropium bromide	10	9.1
Amoxicillin	10	9.1
Oseltamivir	9	8.2
Midazolam	8	7.3
Prednisolone	8	7.3
Hydrocortisone	6	5.5
Azithromycin	5	4.5
Sodium valproate	5	4.5
Route of administration		
Intra Venous	200	49.1
Oral	136	33.4
P/N	44	10.8
Topical	5	1.2

Table 4 shows the Drug-Drug Interactions (DDIs) during Admission. A total of 55 potential DDIs were identified, with 92.7 % of moderate and 7.3 % of severe interactions. The 52.7% of the moderate interactions involved the use of anti-epileptic medications. In 75% of the severe DDIs, opioids were present. Valproic acid and Clobazam had the most frequent moderate interaction (7.8%). The most often used medication in moderate and severe DDIs was phenytoin.

TABLE 4: MODERATE AND SEVERE DRUG-DRUG INTERACTIONS DURING ADMISSION

Drug-drug Interactions (DDI)	Frequency (N = 55)	Percentage (%)
Moderate DDI	51	92.7
Combinations of moderate DDI		
Valproic acid + Clobozam	4	7.8
Levitriacetam+ Clobazam	3	5.9
Phenytoin + Midazolam	3	5.9
Phenytoin + Ondansetron	3	5.9
Ranitidine + Midazolam	3	5.9
Furosemide + Albuterol	2	3.9
Ranitidine + Phenytoin	2	3.9
Albuterol + Ondansetron	2	3.9
Azithromycin + Albuterol	2	3.9
Others	27	52.9
Severe DDI	4	7.3
Combinations of severe DDI		
Fentanyl + Clobazam	1	25.0
Haloperidal + Promethazine	1	25.0
Valproic acid + Phenytoin	1	25.0
Phenytoin + Midazolam	1	25.0

The length of hospital stay and the medications provided upon discharge are shown in **Table 5**. The mean duration of hospitalization was 4 days, with 71.8% of patients falling within range of 2–5 day. One day was the shortest stay duration while 37 days was the longest. Acetaminophen (12.7%) and prednisolone (10.9%) were the most frequently prescribed drugs upon discharge.

TABLE 5: LENGTH OF HOSPITAL STAY AND DRUGS PRESCRIBED ON DISCHARGE

Variables	Frequency (N)	Percentage (%)
Mean Length of stay in hospital	4 days	
Distribution of Length of stay		
2-5 Days	79	71.8
5-10 Days	19	17.3
1 Days	7	6.4
>10 Days	5	4.6
Drugs prescribed on discharge		
Acetaminophen	14	12.7
Prednisolone	12	10.9
Clobazam	11	10.o
Levetiracetam	10	9.1
Levosalbutamol	10	9.1
Amoxicillin	9	8.2
Ranitidine	9	8.2
Calcium & vitamin D	7	6.4
Cefixime	6	5.5
Lansoprazole	6	5.5
Phenytoin	6	5.5
Zinc	6	5.5
Montelukast	6	5.5
Nacl drops	6	5.5
Oseltamivir	5	4.6
Pantoprazole	5	4.6
Other Vitamins	5	4.6

Table 6 lists the number of drugs prescribed and prescriptions containing high- alert medications. The average number of medications per prescription was around 4, with a minimum of one drug per prescription. The term "polypharmacy" was met by 58 prescriptions (52.8%) that contained five or more medications. High-alert medicines were prescribed in 19.1% of cases. Midazolam (7%) was the most often recommended high-alert medicine, whereas Vecuronium (0.9%), Triclofos (0.9%), and Promethazine (0.9%) were the least.

TABLE 6: DETAILS OF NUMBER OF DRUG PRESCRIBED AND HIGH ALERT MEDICATIONS

Variables	Frequency (N)	Percentage (%)
Prescription of drugs (Mean ± SD)	3.65±2.36	
<5 drugs	52	47.3
>= 5 drugs	58	52.8
High alert medications	21	19.1
Distribution of High alert medications		
Midazolam	8	7.3
Magnesium sulphate	3	2.7
Fentanyl	3	2.7
Adrenaline	2	1.8
Heparin	2	1.8
Promethazine	1	0.9
Triclofos	1	0.9
Vecuronium	1	0.9

DISCUSSION: Studies have yet to be done on the attributes of pediatric emergency departments or epidemiological information in both developed and developing nations. Data on patient profiles and ED visit characteristics is vital for the efficient management of the emergency healthcare unit. Therefore, the focus of this study was on the dynamic characteristics of pediatric ED patients. We enrolled and followed up on 110 pediatric patients who were admitted to the ED throughout our study. Male participants dominated the study. In the adolescent group, girls outnumbered males even though there were more males than females. The majority of the population consisted of children aged 1 to 10 years. The majority of the research participants belonged to class III socioeconomic status.

Demographic considerations have a substantial impact on the treatment and outcomes of pediatric patients in ED. Research has indicated that there are notable differences in the age distribution of patients who visit pediatric emergency departments, with distinct patterns seen in different age groups. A study on pediatric gastroenteritis cases in the ED discovered variations in symptoms and triage grades according to age, with pediatric patients aged 0 to 1 years having the greatest hospitalization rate [14, 15]. Furthermore, a review of pediatric emergency department visits revealed males account for the majority of pediatric emergency visits, but females are more common in adolescence, with differences in diagnosis and disease care across the sexes [16]. These results are consistent with our observations. These findings highlight the need to consider demographic considerations while providing emergency care to pediatric patients to ensure equitable and effective management.

In our study, vomiting, fever, and seizures were the most common complaints mentioned by the admitted patients. Febrile seizures were the most common diagnosis. A substantial medical history was reported, with the most common conditions being respiratory issues and febrile seizures. Our results are in line with the preceding study's findings, which stated that fever, coughing, and vomiting are the most frequent symptoms made by pediatric ED patients [17]. Understanding these common complaints is critical for ED staff to improve their preparedness and quality of care for pediatric patients, particularly in general emergency settings. Acetaminophen was the most often recommended drug to patients in our research, both at admission and upon discharge. The intravenous route was used to treat the majority of patients. Our findings are in line with other research, which found that a variety of pharmaceuticals are often provided in pediatric

emergency care settings. These drugs include opioids, benzodiazepines, acetaminophen, ibuprofen, and amoxicillin [18]. Additionally, the inappropriate use of analgesics like acetaminophen and ibuprofen has been documented [19]. These results underscore the substantial usage of opioids, acetaminophen, and antibiotics in pediatric emergency care, highlighting the significance of prescription pattern monitoring to guarantee adequate and safe drug practices.

In our investigation, 55 possible DDIs were found, with 92.7% of them having moderate interactions and 7.3% having severe interactions. As several research investigations have shown, potential drug-drug interactions (PDDIs) in pediatric emergency treatment are a serious problem. Research carried out in pediatric wards has demonstrated that a higher chance of potentially significant drug-drug interactions is linked to the number of prescribed medications, extended hospital stays, and the existence of complicated chronic diseases [20]. Furthermore, PDDIs can occur frequently in pediatric emergency care settings; a study found that 33.25% of hospitalized pediatric patients had PDDIs [21]. The identification and management of PDDIs in pediatric patients can be facilitated by the use of drug interaction databases. This highlights the significance of appropriate monitoring and intervention techniques to reduce the hazards associated with these interactions. It is essential to put in place monitoring systems that are suitable and adapted to the needs of pediatric emergency care units to protect patients and avoid negative consequences associated with PDDIs.

In our study, the average length of hospitalization was 4 days, with the shortest stay being one day and the longest being 37 days. The length of hospital stay in pediatric emergency care varies based on various factors [22, 23]. Understanding these factors can help healthcare providers to effectively manage pediatric patients in emergency care settings to optimize treatment and outcomes. In our analysis, prescriptions contained at least one medicine, with an average of four pills per prescription. In our study, the term "polypharmacy" was met by 52.8% of instances that contained five or more prescriptions and 19.1% of cases had the prescription of high-alert medications. A major concern in pediatric ED is polypharmacy. Studies have demonstrated that children receiving pediatric palliative care frequently need more than one medicine because of complicated life-limiting illnesses, which increases the risk of polypharmacy [24, 25]. These results corroborate our study. These findings highlight the significance of careful prescription pattern in emergency settings, particularly for vulnerable populations such as pediatrics, to reduce the risks associated with polypharmacy and enhance patient safety and outcomes. In pediatric emergency treatment, high-alert drugs carry a high risk of major prescription errors and adverse effects. Research has indicated that children and young adults are especially susceptible to medication mistakes when taking High-alert drugs [26]. Pharmacists have recognized particular drug-related issues and have developed strategies to help pediatric patients avoid harm from high-alert drugs [27]. Therefore, in pediatric ED, clinical pharmacist interventions are required. These results highlight the value of a multidisciplinary approach in pediatric emergency care settings to medication safety, patient satisfaction, and optimizing treatment and outcomes.

Limitation: The sample size and duration of the study are the primary limitations of this investigation. Small sample sizes may impact measurement variability. A larger prospective cohort or a randomized-controlled trial is required to figure out the profiles and assess the outcomes of emergency departments on the pediatric population. The study had selection bias as patients were recruited from a single center, which may not reflect the actual incidence of ED admissions of the pediatric population.

CONCLUSION: The most frequent diagnosis in our study was febrile seizure, and the majority of pediatric patients who visited the ED reported having a fever, vomiting, and seizures. The predominant age group was children (1–10 years), and the male-female ratio was 1.2:1. More than half of the prescriptions included polypharmacy, and a considerable number of possible drug-drug interactions were identified. Opioids accounted for the majority of the severe drug- drug interactions, highlighting the significance of closely monitoring patients when using opioids.

The alarmingly high frequency of febrile seizures is a public health issue indicating a lack of information among caregivers on how to manage fever in the early stages at home. The rising use of anti-epileptics necessitates adequate dosing based on body weight, dose titrations depending on response, and continuous monitoring for potential drug-drug interactions. As a result, this study emphasizes the engagement of a clinical pharmacist in the ED will be advantageous in improving patient education to minimize repeat occurrences of seizures and other difficulties and reduce the possibility of drug interactions.

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REFERENCES:

1. El Zahran T, Ghandour L, Chami A, Saliba N and Hitti E: Comparing emergency department visits 10 years apart at a tertiary care center in Lebanon. Medicine (Baltimore) 2023; 102: 35194.
2. Masrani AS, Nik Husain NR, Musa KI, Moraga P and Ismail MT: The changing trend of pediatric emergency department visits in Malaysia following the COVID-19 pandemic. Cureus 2023; 15(3): e36512.
3. Teela L, Verhagen LE and van Oers HA: Pediatric patient engagement in clinical care, research and intervention development: a scoping review. J Patient Rep Outcomes 2023; 7: 32.
4. Hasan M, Cakir A and Ozdemir N: Determination of potential drug-drug interactions in general pediatric ward patients: a cross-sectional study. Ankara Üniversitesi Eczacılık Fakültesi Dergisi 2023. doi: 10.33483/jfpau.1241376.
5. Tahir Y, Shabbir H, Fazal A and Atif Z: Pediatric injury patterns presenting at a tertiary care hospital emergency department. Pakistan Journal of Medical and Health Sciences 2023; 17(1).
6. Kuitunen S, Saksa M and Tuomisto J: Medication errors related to high-alert medications in a pediatric university hospital – a cross-sectional study analyzing error reporting system data. BMC Pediatr 2023; 23: 548.
7. Medeiros DNM, Mafra ACCN, Souza DC and Troster EJ: Epidemiology and treatment of sepsis at a public pediatric emergency department. Einstein (Sao Paulo) 2022; 20: eAO6131.
8. He M, Huang Q and Lu H: Call for decision support for high-alert medication administration among pediatric nurses: findings from a large, multicenter, cross-sectional survey in China. Front Pharmacol 2022; 13: 860438.
9. Soheilirad Z, Karimian P and Aghajani Delvar M: COVID-19 in pediatric patients: an update on features and treatment options. Tanaffos 2022; 21(3): 283-292.
10. De Filippo M, Magri P and Bossi G: Clinical and epidemiological features of pediatric patients with COVID-19 in a tertiary pediatric hospital. Acta Biomed 2022; 93(3): e2022039.
11. Cairns C, Ashman JJ and Peters ZJ: Emergency department visits among children aged 0-17 by selected characteristics: United States, 2019-2020. NCHS Data Brief 2023; (469): 1-8.
12. Freedman SB, Roskind CG and Schuh S: Comparing pediatric gastroenteritis emergency department care in Canada and the United States. Pediatrics 2021; 147(6): e2020030890.
13. Hitti E, Geha M and Hadid D: The disease spectrum of adult patients at a tertiary care center emergency department in Lebanon. PLoS One 2019; 14: e0216740.
14. Mowafi H, Ngaruiya C and O'Reilly G: Emergency care surveillance and emergency care registries in low-income and middle-income countries: conceptual challenges and future directions for research. BMJ Glob Health 2019; 4(6): e001442.
15. Benini F, Castagno E and Barbi E: Multicentre emergency department study found that paracetamol and ibuprofen were inappropriately used in 83% and 63% of pediatric cases. Acta Paediatr 2018; 107(10): 1766-1774.
16. Zachariasse JM, Borensztajn DM and Nieboer D: Sex-specific differences in children attending the emergency department: prospective observational study. BMJ Open 2020; 10(9): e035918.
17. Yoong SYC, Ang PH and Chong SL: Common diagnoses among pediatric attendances at emergency departments. BMC Pediatr 2021; 21(1): 172.
18. Nasso C, Mecchio A and Rottura M: A 7-years active pharmacovigilance study of adverse drug reactions causing children admission to a pediatric emergency department in Sicily. Front Pharmacol 2020; 11: 1090.
19. Peterson SM, Harbertson CA and Scheulen JJ: Trends and characterization of academic emergency department patient visits: a five-year review. Acad Emerg Med 2019; 26: 410–9.
20. Hooker EA, Mallow PJ and Oglesby MM: Characteristics and trends of emergency department visits in the United States (2010-2014). J Emerg Med 2019; 56: 344–51.
21. Winquist A, Klein M, Tolbert P, Flanders WD, Hess J and Sarnat SE: Comparison of emergency department and hospital admissions data for air pollution time-series studies. Environ Health 2012; 11: 70.
22. Baier N, Geissler A and Bech M: Emergency and urgent care systems in Australia, Denmark, England, France, Germany, and the Netherlands – analyzing organization, payment, and reforms. Health Policy 2019; 123: 1–10.
23. Choi YH, Lee IH and Yang M: Clinical significance of potential drug-drug interactions in a pediatric intensive care unit: a single-center retrospective study. PLoS One 2021; 16(2): e0246754.
24. Sheehan R, Stajkowski A and Hraby L: Effect of pharmacist intervention on emergency department geriatric patients with polypharmacy. Journal of Geriatric Emergency Medicine 2022; 3(5).
25. Singhi S, Jain V and Gupta G: Pediatric emergencies at a tertiary care hospital in India. J Trop Pediatr 2003; 49(4): 207-211.

26. Huang Q, Hu Y and Gu Y: Clinical characteristics and outcomes of pediatric patients with COVID-19 in Wuhan: a multicenter study. J Pediatr 2020; 221: 106-112.

27. Jain V, Gupta G and Singhi S: Clinical profile and outcomes of pediatric patients with COVID- 19: a single-center experience. J Trop Pediatr 2021; 67(1): 1-6.

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