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# Profile of patients visiting the emergency departments at Haji Adam Malik and Universitas Sumatera Utara hospitals in Medan, Indonesia

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## ABSTRACT

**Objectives:** Data on the patient profiles and characteristics of emergency department (ED) visits are crucial for enhancing hospital emergency care resources and developing a more effective emergency healthcare unit. The aim of this study was to report the characteristics and trends of pediatric ED visits at Haji Adam Malik (HAM) and Universitas Sumatera Utara (USU) hospitals in Medan, Indonesia, during the year 2020.

**Methods:** This was a retrospective descriptive study conducted in HAM Hospital and USU Hospital, using patient medical records data extracted from the hospital information systems for the period January to December 2020.

**Results:** This study included 3462 pediatric patients as participants. The majority of the patients in this study were male (57.8%), and the most represented age group was 11–18 years (35.8%). Trauma/injury was the most common ED diagnosis at HAM Hospital, whereas unspecified fever was the most common reason for visits to the ED at USU Hospital. The majority of patients attending the ED at HAM Hospital were hospitalized, while the majority at USU Hospital were treated as outpatients.

**Conclusions:** This study found that the most frequent diagnosis in the ED was trauma/injury at HAM Hospital and unspecified fever at USU Hospital.

## 1. Introduction

The emergency department (ED) is the most important and frequented unit in a hospital [1]. In 2014, approximately 14 402 250 patients visited Indonesia's emergency rooms [2]. However, published data on hospital admissions and the mortality rate in Indonesia's pediatric EDs are still limited [3]. In order to improve the efficacy of the patient care plan in the ED, it is important to understand the patient's epidemiology and profile, especially in pediatric care [4].

According to a report based on Riset Kesehatan Dasar (Riskesdas), the most common causes of death in children aged 0–6 days were respiratory disorders/infections (35.9%), prematurity (32.4%), and sepsis (12%). Meanwhile, the causes of infant mortality at the age of 7–28 days were sepsis (20.5%), congenital abnormalities (18.1%), and pneumonia (15.4%). The main causes of death in infants aged 29 days to 11 months were diarrhea (31.4%), pneumonia (23.8%), and meningitis/encephalitis (9.3%) [5]. A study conducted in Surabaya, Indonesia revealed that sepsis due to respiratory failure and meningitis was the leading cause of death among pediatric ED patients [3]. Therefore, patient profiles and characteristics of ED visits are crucial for enhancing

hospital emergency care resources and developing a more effective emergency healthcare unit [6].

The purpose of this study was to describe the demographics and trends of pediatric ED visits at Haji Adam Malik (HAM) Hospital and Universitas Sumatera Utara (USU) Hospital in Medan, Indonesia.

## 2. Methods

This was a retrospective descriptive study using data from the patient medical records; the data were extracted from the information systems of the participating hospitals, covering the period January to December 2020, during the COVID-19 pandemic. Data for profiling pediatric patients were collected at HAM Hospital and USU Hospital, both in Medan, Indonesia. The inclusion criteria were all medical records of pediatric patients diagnosed with sepsis in the year 2020. This study reports the characteristics of groups based on age, outcomes following the ED visits, patient diagnoses, comorbidities, and area of residence. Diseases were classified according to the International Classification of Diseases 10th Revision (ICD-10).

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**Table 1**  
Characteristics of the pediatric patients visiting the emergency departments.

	Haji Adam Malik Hospital n (%)		Universitas Sumatera Utara Hospital n (%)
Sex			
Male	1574 (58.3%)		428 (56.0%)
Female	1124 (41.7%)		336 (44.0%)
Age group			
Baby	822 (30.5%)		173 (22.6%)
Toddler	344 (12.8%)		143 (18.7%)
Child	561 (20.8%)		181 (23.7%)
Adolescent	971 (36.0%)		267 (34.9%)
Comorbidity			
With	159 (5.9%)		98 (12.8%)
Without	2539 (94.1%)		666 (87.2%)
Outcome			
Home treatment	942 (34.9%)		435 (56.9%)
Hospitalized	1684 (62.4%)		321 (42%)
Died	72 (2.7%)		8 (1.0%)
Diagnosis <sup>a</sup>			
Trauma/injury	325 (12.0%)	Unspecified fever	107 (14.0%)
COVID-19	205 (7.6%)	Trauma/injury	89 (11.6%)
ALL	132 (4.9%)	Gastroenteritis	59 (7.7%)
CHD	127 (4.7%)	COVID-19	57 (7.4%)
RDS	96 (3.6%)	Dyspepsia	31 (4.1%)
Area of residence			
In Medan City	930 (34.5%)		580 (75.9%)
Outside Medan City	1768 (63.5%)		184 (24.1%)
Total	2698		764

ALL, acute lymphoblastic leukemia; CHD, congenital heart disease; RDS, respiratory distress syndrome.

<sup>a</sup> Top five ranking.

### 3. Results

This study used medical records data from the year 2020 collected in the two hospitals. Overall, 3462 pediatric patients from 4380 total visits to the ED were included. The characteristics of the included patients are shown in Table 1. The majority of the patients were male (57.8% male, 42.2% female; male-to-female ratio, 1.37:1).

The most represented age group for these pediatric patients sent to the EDs in 2020 was 11–18 years (35.8%), at both of the hospitals: 971 (36.0%) of the patients at HAM Hospital and 267 (34.9%) of the patients at USU Hospital were in this age group.

Regarding the outcomes of the ED visits, the majority of the patients attending HAM Hospital were hospitalized (1.8 times as many hospitalized patients as outpatients), while the majority of patients attending USU Hospital were treated as outpatients (1.4 times as many outpatients as hospitalized patients).

The top five most common diagnoses from the ED visits at HAM Hospital, in descending order, were trauma/injury (ICD10; T14.90XA), COVID-19 (ICD10; U07.1), acute lymphoblastic leukemia (ICD10; C91.0), congenital heart disease (ICD10; P09.5), and newborn respiratory distress syndrome (ICD10; P22.0). The top five most common diagnoses from the ED visits at USU Hospital were unspecified fever (ICD10; R50.9), trauma/injury (ICD10; T14.90XA), gastroenteritis (ICD10; A09.0), COVID-19 (ICD10; U07.1), and dyspepsia (ICD10; K30) (Fig. 1).

Most of the pediatric patients did not have any comorbidities. Only approximately 12.8% of the total patients attending USU Hospital and 5.9% of the total patients attending USU Hospital had a comorbidity. The most common comorbidity was observed to be associated with heart disease in pediatrics.

The majority of the patients visiting the ED at HAM Hospital resided outside Medan (1.9:1). In contrast, the majority visiting the ED at USU Hospital resided in Medan City (3.2:1).

### 4. Discussion

There are relatively few reports or studies on the admission of pediatric patients to the ED, particularly in developing nations [7]. Due

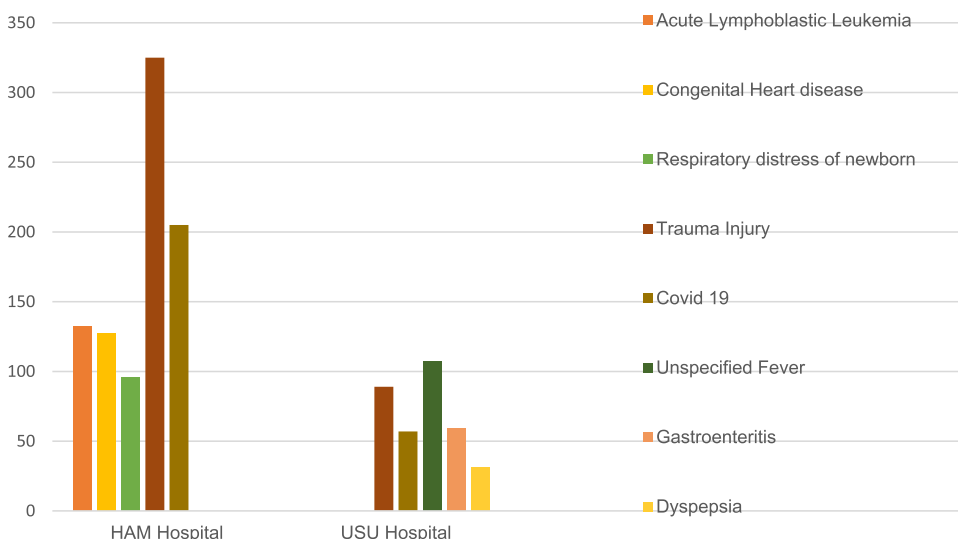
to the pandemic, it is possible that the number of visits decreased. According to data from hospitals in Italy during the COVID-19 pandemic, parents were hesitant to seek hospital care for their children. Several studies reported identical findings regarding the reduction of hospital care visits, whether for daily care or the ED [8].

In 2020, adolescents were the most common age group to visit the ED. This could be explained by the fact that adolescents can express their discomfort to their parents and that this age group may receive less parental attention to their health. This result is consistent with the findings of Bazmul et al., who conducted research at the Prof. Dr. R. D. Kandou Manado Hospital, Indonesia and reported that 1999 patients aged 11–18 years made the most visits to the emergency room [9]. However, the data differ from research conducted in Korea, where the majority of pediatric ED visits involved children aged 1–4 years [8].

In this study, the majority of the pediatric patients who visited the ED were male (57.8%). In a study performed in 2011 at Dr. Soetomo Surabaya Hospital in Indonesia, it was found that more male patients than female patients visited the emergency room [3]. This could be explained by the higher population of males than females in Indonesia, with 136 142 501 male residents and 134 923 865 female residents (Indonesian Health Profile 2020). Similar to the research conducted in Korea, more men than women visited the emergency room [7]. In a study performed in Saudi Arabia, Al-Qahtani et al. found that the total number of male and female emergency room visitors was 25 675 (55.4%) and 20 699 (44.6%), respectively [4].

In this study, 72 pediatric patients (2.7% of the total) attending the ED at HAM Hospital and eight pediatric patients (1.0%) attending the ED at USU Hospital died. The mortality rate is very close to that found in another study, which reported an overall mortality rate for pediatric patients of approximately 1.7% [3].

Trauma/injury was the most common diagnosis, which could be explained by the irregular traffic and traffic regulations in Medan, Indonesia, where many underage and unlicensed drivers break the law by driving or riding on the road. Pediatric trauma cases did not drastically change in number, despite the stay-at-home order from the government during the COVID-19 pandemic [10]. The second most common diagnosis was unspecified fever; a large number of pediatric patients attended the ED with complaints of generalized fever of unknown eti-



**Fig. 1.** Distribution of the top five ranking diagnoses in emergency visits to the two hospitals. HAM Hospital, Haji Adam Malik Hospital; USU Hospital, Universitas Sumatera Utara Hospital.

ology. Moreover, parental anxiety caused parents to immediately bring their children to the ED for unspecified fever. In a study conducted by Mangunkusumo et al., pneumonia was the most common diagnosis, followed by dyspepsia and hypertension [11]. This differs from a 2015 study conducted in the United States, which found that more pediatric ED visits were for respiratory disorders than for injuries or poisoning [12]. A study conducted in Belgium revealed that minor trauma, asthma, injuries, and insect bites were the most common summertime diagnoses [13]. This difference in findings may be attributable to geographical location and infection epidemiology.

The study findings are consistent with the study of Kwak et al. published in 2012, which found that 440 284 (27%) pediatric patients had visited the ER at least once, due to trauma (26%) and respiratory tract infections (22%) [8]. However, according to a 1998 study conducted in India, respiratory disorders and gastrointestinal diseases accounted for the majority of pediatric ED visits, with only a slight difference in the number of cases between the two [14].

Only 257 out of the 3462 study patients (7.4%) had comorbidities. Heart disease was the most frequently reported comorbidity. This result differs from that of a study conducted in hospitals in the United Kingdom during the pandemic in 2020, in which 42% of 651 pediatric patients admitted had at least one comorbidity [15].

A limitation of this study is that it only provides data for pediatric patients attending the ED in 2020. Trends in pediatric patients prior to and during the pandemic were not compared. Future research should compare pediatric patient trends and describe the causes of mortality.

#### 4.1. Limitations

In this journal, the collected data are from 2011, which is considered to be a general description of emergency department visits compared to this study, which describes the condition of hospital visits during the COVID-19 pandemic.

#### 4.2. Conclusions

This study revealed that the majority (57.8%) of the patients attending the EDs of both hospitals during 2020 were male. Trauma and COVID-19 were the most common diagnoses in the ED of Haji Adam Malik Hospital. In the ED of Universitas Sumatera Utara Hospital, the most common diagnoses were unspecified fever and trauma/injury.

#### Transparency declaration

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#### Declarations

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**Conflict of interest:** None declared.

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