

Analysis of pediatric hand injuries in a tertiary care children's hospital

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Pediatric hand traumas are common injuries in childhood. The incidence and type of injury vary with age. In our country, there are only two publications in which only crush is examined in etiology. In this study, we aimed to develop a strategy to prevent hand injuries by examining pediatric hand injuries according to the child's developmental stage and anatomical region. The data of 493 (315 boys, 178 girls) patients under the age of 18 between 2016 and 2020 were analyzed. Patients were categorized according to etiology and age. Males are more dominant in pediatric hand injuries (63.9%). The most common cause of hand injuries under the age of 4 years is scald burns. While distal phalanx fractures (79.7%) are more common under 7 years of age, little finger fractures (44.7%) are more common than other finger fractures over 7 years of age. The reason for the increase in fifth metacarpal (neck) fractures between the ages of 12 and 17 years is fighting and punching. Door/window jamming injuries (60.7%) are more common under the age of 7 years, while there is an increase in sports injuries (94.7%)

over the age of 7 years. The findings of this study provided age-specific information about the anatomical site, objects, activities, mechanisms, diagnosis, and treatment associated with hand and finger injuries. While developing a strategy to prevent childhood hand and finger injuries in Turkey, it is necessary to focus on age. *J Pediatr Orthop B* XXX: XXXX-XXXX Copyright © 2024 Wolters Kluwer Health, Inc. All rights reserved.

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Introduction

Hand and wrist injuries are among the most frequently injured parts of the body during childhood [1]. Hand injuries can range from simple injuries and burns to bone fractures in the hand region and even complex injuries such as nerve and tendon injuries of that region [2]. Hand injuries constitute approximately 2% of pediatric emergency department admissions [3,4]. A detailed study has not yet been conducted in Turkey regarding the location, mechanism of injury, and type of injury of pediatric hand injuries admitted to the pediatric emergency department. Although the importance of a pediatric hand injury prevention strategy has been mentioned many times in the literature, there is a need for a comprehensive study on this subject in Turkey. Epidemiological studies of pediatric hand injuries have generally focused on fingertip injuries, fractures, and burns [5–11]. A detailed analysis from the wrist to the fingertip can provide an idea about preventing these injuries.

Disability resulting from hand injuries is a significant psychological and economic burden in Turkey. If parents manage to take precautions before injury occurs, and if physicians know how to solve hand injuries together with expert consultations, we can reintegrate these individuals

into society. This is the greatest contribution of this study to the community.

In particular, for children, it is crucial to develop a strategy for preventing pediatric hand injuries according to the child's developmental stage. Therefore, the epidemiological features of hand and finger injuries are examined in children who were admitted to a pediatric emergency department to determine preventive strategies for these injuries, considering the child's developmental stages.

Methods

A retrospective review of pediatric patients admitted to the Children's Hospital Emergency Department due to hand and finger injuries was performed between 2016 and 2020. Children's Hospital is a level 3 trauma center mainly serving one of the districts (population of 687 535 in 2022) of Ankara, visited by approximately 120 000 children aged younger than 18 years annually. Patients admitted due to trauma, including medical illness or hand and finger injuries, are first examined by the pediatric emergency physician and consulted with the orthopedics and plastic surgery departments. In all admissions, burn cases were referred to plastic surgery, and all other injuries were referred to orthopedics. Children aged younger

than 18 years and patients diagnosed with all kinds of trauma such as burns, fractures, soft tissue trauma (contusion), stab wounds (laceration), and nail bed injuries with various mechanisms only in the distal region of the wrist and hand and finger injuries were included. Patients with not only hand and finger injuries but also other injuries such as head, leg, and chest injuries and those who previously applied to a department other than pediatrics were excluded. Hand injuries associated with injury to another part of the body were not included in the study because they represent a more serious high-energy (e.g. traffic accident) injury mechanism.

Data were obtained from electronic Health Information and Management Systems records. Patient age, sex, specific anatomical position (right hand, left hand, palm, back of the hand and finger), application complaint (fall, cut/puncture, impact/hit, burn, sports injury), and diagnosis (fracture, burn, laceration, contusion/sprain, and nail bed injury) were collected in consultation with specialized clinical departments, orthopedics, or plastic surgery, and treatment applied [e.g. conservative (splint), closed pinning, nail bed repair, suture, exploration]. Patients were classified according to five age groups: under 1 year old, 1 to less than 4 years old, 4 to less than 7 years old, 7 to less than 12 years old, and 12 to less than 18 years old. The purpose of dividing patients into age groups was to understand the effect of childhood developmental stages on etiology. This study was approved by the ethics committee (İÖ2-78-23) and was conducted according to the principles of the Helsinki Declaration.

Statistical analysis

Descriptive statistics were presented as mean ± SD for the variables, whereas they were presented as number and percentage for nominal variables. Categorical variables were evaluated using Pearson’s chi-square test as appropriate. A *P* value of less than 0.05 was considered statistically significant and the analyses were conducted using the Statistical Package for Social Sciences (SPSS, Version 15.0; SPSS Inc., Chicago, Illinois, USA).

Results

A total of 493 patients were diagnosed with hand and finger injuries. Of 493 patients, 315 (63.9%) were male (Table 1). The mean age was 8.93 ± 5.18 (minimum 4

months, maximum 17 years). Patients aged 12–17 years were the most frequently injured, 35.9% (*n* = 177) of the study population. Fractures were the most common admission between the ages of 12 and 17 years (45.3%) (Table 2). Males had a significantly higher predominance (74%) in patients aged 12–17 years. The right hand was injured in 272 (55.2%) patients, and the left hand was injured in 214 (43.4%) patients (Table 1).

Conservative treatment (with splint) was applied to 424 (84.1%) patients. Closed pinning 35 (6.9%) was the most commonly used technique in surgery. About 40 (8.1%) of the patients were hospitalized and followed up. Of the hospitalized patients, 32 (80%) were hospitalized for fractures, five (12.5%) for nail bed injury, five (12.5%) for incisions, and one (2.5%) for soft tissue trauma. The mean hospital stay of the patients was 1.45 ± 1.04 (0–6 days) days. Notably, 19 (9.9%) patients aged 0–6 years were hospitalized. Hospitalization was statistically significant between patients under 5 years old and those aged 5 and above (*P* = 0.004). The number of hospitalized children under 5 years old was 11 (27.5%), while the number of hospitalized children aged 5 and above was 29 (72.5%) (Table 3).

The mechanisms of injury varied according to the age group and showed certain patterns. The injury in 23 of 24 patients under 1 year of age was burn. The most common cause of injury in children under the age of 4 years was burns (Fig. 1). Under the age of 4 years, most commonly, the palms and then the back of the hand are injured due to burning (Fig. 2). After age 4 years, there was a significant decrease in burn cases (*P* < 0.001) (Table 4).

When fractures were examined, the incidence in boys was significantly higher than that in girls (*P* = 0.006). Fractures of the distal phalanges of the first, third, and fourth fingers were the most common in children under the age of 7 years (*P* = 0.004, *P* = 0.036, and *P* < 0.001, respectively). The fractures of the proximal phalanx in the fifth finger were the most common among children over 3 years (*P* < 0.001). Over the age of 7 years, fractures of the little fingers (44.7%) were found more frequently than other finger fractures (*P* < 0.001). The frequency of the fifth metacarpal (neck) fracture was significantly higher in the 12- to 17-year age group than in the 7- to 12-year age group (*P* < 0.001) (Table 3 and

Table 1 Sex and side distribution of hand injuries by age

	Age, <i>n</i> (%)					Total, <i>n</i> (%)
	<1	1–4	4–7	7–12	12–18	
Sex						
Male	13 (54.2)	50 (55.6)	48 (62.3)	73 (58.4)	131 (74.0)	315 (63.9)
Female	11 (45.8)	40 (44.4)	29 (37.7)	52 (41.6)	46 (26.0)	178 (36.1)
Side						
Right	15 (62.5)	46 (51.1)	36 (46.8)	71 (56.8)	104 (58.8)	272 (55.2)
Left	9 (37.5)	40 (44.4)	39 (50.6)	53 (42.4)	73 (41.2)	214 (43.4)
Bilateral	0 (0)	4 (4.4)	2 (2.6)	1 (0.8)	0 (0)	7 (1.4)

Table 2 Characteristics of fractures

	Age, <i>n</i> (%)					Total, <i>n</i> (%)
	<1	1–4	4–7	7–12	12–18	
Sex						
Male	0 (0)	14 (56.0)	38 (67.9)	64 (60.4)	122 (78.7)	238 (69.6)
Female	0 (0)	11 (44.0)	18 (32.1)	42 (39.6)	33 (21.3)	104 (30.4)
Etiology						
Fall	0 (0)	12 (48.0)	28 (50)	60 (56.6)	90 (58.1)	190 (55.6)
Bump hit	0 (0)	0 (0)	5 (8.9)	11 (10.4)	33 (21.3)	49 (14.3)
Door jam	0 (0)	4 (16.0)	10 (17.9)	9 (8.5)	2 (1.3)	25 (7.3)
Jam	0 (0)	8 (32.0)	9 (16.1)	11 (10.4)	8 (5.2)	36 (10.5)
Athlete injury	0 (0)	0 (0)	2 (3.6)	13 (12.3)	22 (14.2)	37 (10.8)
Penetrating	0 (0)	1 (4.0)	1 (1.8)	2 (1.9)	0 (0)	4 (1.2)
Others	0 (0)	1 (1.8)	0 (0)	0 (0)	0 (0)	1 (0.3)
Side						
Right	0 (0)	15 (60.0)	28 (50.0)	58 (54.7)	94 (60.6)	195 (57)
Left	0 (0)	10 (40.0)	28 (50.0)	48 (45.3)	61 (39.4)	147 (43)
Localization						
First						
Metacarpal	0 (0)	0 (0)	4 (30.8)	2 (13.3)	12 (63.2)	18 (33.4)
Proximal phalanx	0 (0)	2 (28.6)	2 (15.4)	7 (46.7)	5 (26.3)	16 (29.6)
Distal phalanx	0 (0)	5 (71.4)	7 (53.8)	6 (40.0)	2 (10.5)	20 (37)
Second						
Metacarpal	0 (0)	0 (0)	1 (10.0)	3 (27.3)	7 (70.0)	11 (31.4)
Proximal phalanx	0 (0)	2 (50.0)	4 (40.0)	3 (27.3)	2 (20.0)	11 (31.4)
Middle phalanx	0 (0)	0 (0)	1 (10.0)	2 (18.2)	1 (10.0)	4 (11.4)
Distal phalanx	0 (0)	2 (50.0)	4 (40.0)	3 (27.3)	0 (0)	9 (25.8)
Third						
Metacarpal	0 (0)	0 (0)	1 (12.5)	7 (41.2)	4 (28.6)	12 (27.9)
Proximal phalanx	0 (0)	0 (0)	0 (0)	4 (23.5)	4 (28.6)	8 (18.6)
Middle phalanx	0 (0)	1 (25.0)	0 (0)	3 (17.6)	3 (21.4)	7 (16.3)
Distal phalanx	0 (0)	3 (75.0)	7 (87.5)	3 (17.6)	3 (21.4)	16 (37.2)
Fourth						
Metacarpal	0 (0)	0 (0)	0 (0)	3 (18.8)	9 (31)	12 (24.0)
Proximal phalanx	0 (0)	1 (20.0)	0 (0)	5 (31.1)	9 (31)	15 (30.0)
Middle phalanx	0 (0)	1 (20.0)	3 (23.1)	8 (50.0)	7 (24.1)	19 (38.0)
Distal phalanx	0 (0)	3 (60.0)	10 (76.9)	0 (0)	4 (13.8)	4 (8.0)
Fifth						
Metacarpal	0 (0)	0 (0)	0 (0)	12 (24.5)	33 (40.7)	45 (31.2)
Proximal phalanx	0 (0)	1 (20.0)	9 (75.0)	30 (61.2)	36 (44.4)	76 (52.8)
Middle phalanx	0 (0)	1 (20.0)	0 (0)	4 (8.2)	8 (9.9)	13 (9.0)
Distal phalanx	0 (0)	3 (60.0)	3 (25.0)	0 (0)	4 (4.9)	10 (7.0)
Scaphoid	0 (0)	0 (0)	0 (0)	0 (0)	2 (100)	2 (100)
Capitatum	0 (0)	0 (0)	0 (0)	1 (100)	0 (0)	1 (100)

Table 3 Treatment distributions and hospitalization

	Age, <i>n</i> (%)					Total, <i>n</i> (%)
	<1	1–4	4–7	7–12	12–18	
Treatment						
Conservative	24 (100.0)	72 (76.6)	63 (76.8)	111 (87.4)	154 (87.0)	424 (84.1)
CRPP	0 (0)	3 (3.2)	11 (13.4)	7 (5.5)	14 (7.9)	35 (6.9)
Nail bed revision	0 (0)	3 (3.2)	6 (7.3)	2 (1.6)	0 (0)	11 (2.2)
Primary suture	0 (0)	14 (14.9)	1 (1.2)	5 (3.9)	7 (4.0)	27 (5.4)
Exploration	0 (0)	0 (0)	0 (0)	2 (1.6)	1 (0.6)	3 (0.6)
Nerve, tendon, and artery repair	0 (0)	2 (2.1)	1 (1.2)	0 (0)	1 (0.6)	4 (0.8)
Hospitalization						
Present	0 (0)	5 (5.6)	14 (18.2)	5 (4.0)	16 (9.0)	40 (8.1)
Absent	24 (100.0)	85 (94.4)	63 (81.8)	120 (96.0)	161 (91.0)	453 (91.9)

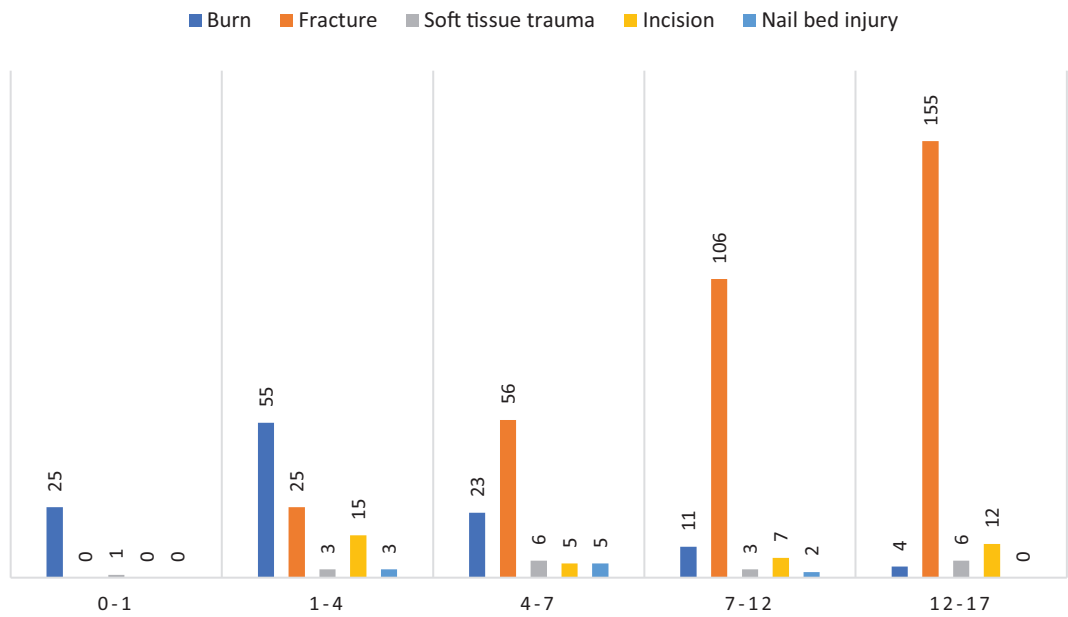
CRPP, closed reduction percutaneous pinning.

Fig. 3). While nail bed injuries were high between 1 and 6 years of age, the incidence decreased significantly after 7 years of age (Fig. 1). Distal phalanx fractures were also observed in seven (70%) patients with nail bed injuries.

While sharp and penetrating injuries were observed most frequently between 1 and 4 years of age, falling with a glass cup in hand was the most common etiology (Fig. 4).

Objects, activity, and entertainment categories caused varying degrees of hand and finger injuries by age group. The most common cause of burns in children under age 1 was a stove and hot tea/water (87%). While door/window jamming (56%) was observed more frequently under 7 years of age, an increase was observed in the rate of sports injuries (94.6%) with falls (79%) over 7 years of age (Figs. 4 and 5).

Fig. 1



Causes of injuries according to age groups.

Fig. 2



Burn injury of a 1-year-old child as a result of boiling in the palmar region and particularly the dorsal fingers.

While the most common hand and finger injury etiology was burning ($n = 80$, 67.8%) under 4 years of age, which is the youngest age group, fractures over 4 years of age were significantly more common than other etiologies.

The patients were also classified as isolated bone, soft tissue injury, and combined injury, as shown in Table 5.

When the frequency of hand and finger injuries in children was examined seasonally, a significant difference was observed between the seasons ($P = 0.008$) (Table 6).

In spring, it was observed as 148 (30.0%), in summer 113 (22.9%), in autumn 134 (27.2%), and in winter 98 (19.9%).

Table 4 Characteristics of hand burns

	Age, n (%)					Total, n (%)
	<1	1–4	4–7	7–12	12–18	
Sex						
Male	14 (56.0)	30 (54.5)	14 (60.9)	5 (45.5)	0 (0)	63 (53.4)
Female	11 (44.0)	25 (45.5)	9 (39.1)	6 (54.5)	4 (100.0)	55 (46.6)
Side						
Right	16 (64.0)	22 (40.0)	7 (30.4)	7 (63.6)	1 (25.0)	53 (44.9)
Left	9 (36.0)	27 (49.1)	13 (56.5)	4 (36.4)	3 (75.0)	56 (47.5)
Bilateral	0 (0)	6 (10.9)	3 (13.0)	0 (0)	0 (0)	9 (7.6)
Hand surface						
Dorsal	5 (20.0)	17 (30.9)	11 (47.8)	3 (27.3)	1 (25.0)	37 (31.4)
Volar	20 (80.0)	38 (69.1)	12 (52.2)	8 (72.7)	3 (75.0)	81 (68.6)
Zone						
1	6 (24.0)	12 (21.8)	2 (8.7)	3 (27.3)	0 (0)	23 (19.5)
2	4 (16.0)	11 (20.0)	4 (17.4)	1 (9.1)	0 (0)	20 (16.9)
3	7 (28.0)	18 (32.7)	2 (8.7)	1 (9.1)	2 (50.0)	30 (25.4)
4	7 (28.0)	10 (18.2)	4 (17.4)	3 (27.3)	1 (25.0)	25 (21.2)
5	0 (0)	3 (5.5)	6 (26.1)	2 (18.2)	0 (0)	11 (9.3)
6	1 (4.0)	1 (1.8)	5 (21.7)	1 (11.1)	1 (25.0)	9 (7.6)
Degree						
1	7 (28.0)	18 (32.7)	6 (26.1)	3 (27.3)	0 (0)	19 (20.0)
2	18 (72.0)	37 (67.3)	17 (73.9)	8 (72.7)	3 (75.0)	75 (78.9)
3	0 (0)	0 (0)	0 (0)	0 (0)	1 (25.0)	1 (1.1)

Fig. 3



Distribution of the total number of fractures in the phalanx, metacarpal, and carpal bones.

The burning frequency is statistically NS among the seasons ($P = 0.205$). In winter, it was observed as 32 (31.4%), in spring 29 (28.4%), in autumn 23 (22.5%), and in summer 18 (17.6%).

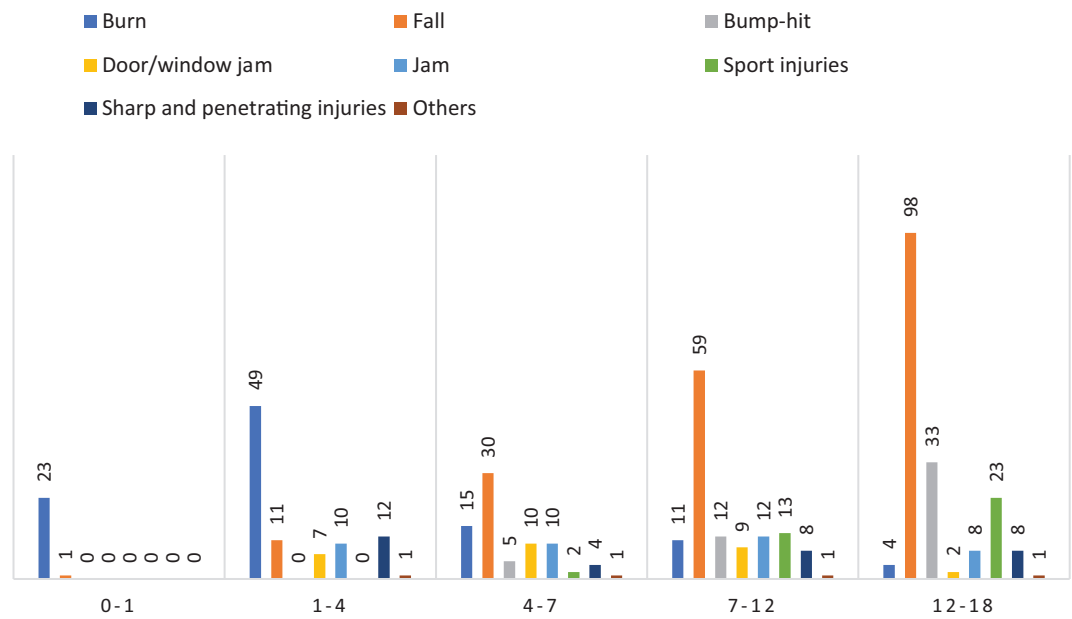
Discussion

This study showed that fewer hand and finger injuries occur in preschool children than in school children. Although the incidence varies according to the age group,

it is more common in school age than in preschool age [2]. Types of injuries vary according to age. Laceration, soft tissue injury, fracture, and sprain are the most common injuries [12]. In two studies conducted in Turkey, Karakas and Yuce [13] found 83.3% and Özdemir *et al.* [14] found 55.0% crushing in etiology. Boys are injured more often than girls, with a boy/girl ratio of approximately 1.81 across all age groups. These results appear to be consistent with those of several previous reports [3,15,16]. While the sex difference was insignificant under the age of 4 years, the male/female ratio increased significantly over [9]. The following reasons can explain the results of this study: Children under the age of 4 years are not yet cognitively aware of the fear of injury and do not show significantly different activity patterns. After early childhood, children have a fear of injury after bad experiences and learn how to avoid it [17]. As boys age, they prefer to engage in contact sports or participate in dangerous recreational activities [18]. They usually have this experience at an earlier age and on the streets [19]. Girls are mostly injured at home and engage in sports generally at school age [20].

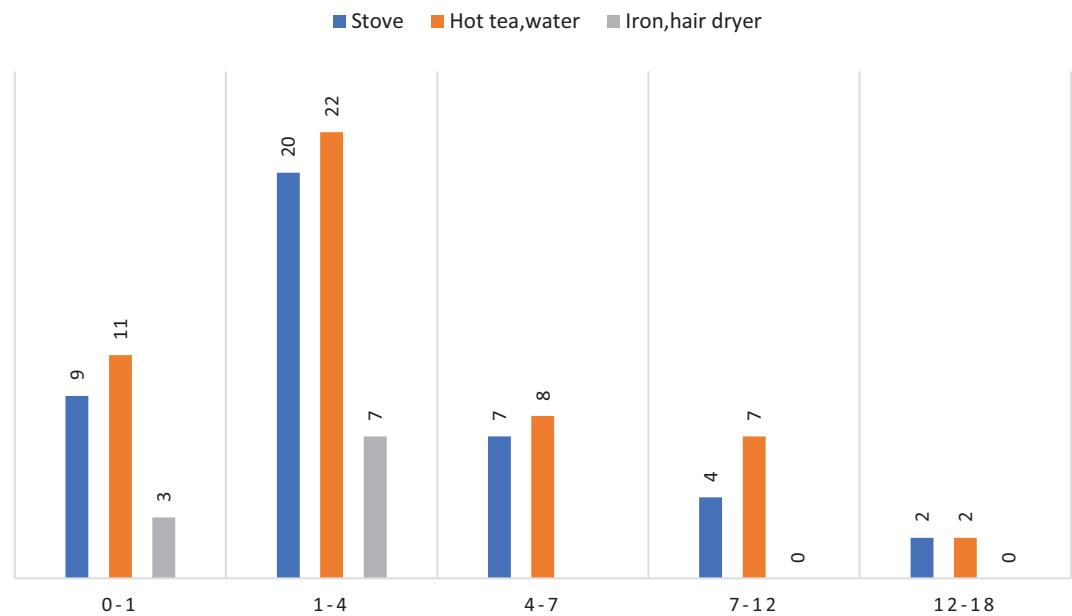
In this study, the anatomical hand and finger injury sites differed depending on age. These results can be attributed to the mechanism of injury, the anatomical location of the fingers, and the lengths and surface areas of parts of the hand. In the group under 1 year of age, burning occurred in a large area of the hand, including the fingers and palms, especially due to touching the hot stove. This is because burning is associated with upper extremity development during infancy. Because fine motor skills are not fully developed in children younger than 1 year old, they try to grasp objects with their palms or whole hands [21]. Children should be strictly instructed not to touch electrical outlets, fireplaces,

Fig. 4



Distribution of injury mechanisms by age groups.

Fig. 5



Distribution of burn causes by age.

stoves, and other heaters. With the development of upper extremities and walking, children start to walk around the furniture, and the walking area where they can move around the house gradually becomes stable at 1–3 years of age [22]. This may explain the frequency of fingertip crush injuries due to the jamming of house

doors and windows in this age group. Seymour fractures are physal fractures of the distal phalanx seen in childhood. The nail bed lacerates and turns into an open fracture, resulting in a mallet deformity. These are underestimated injuries of the nail bed that carry a high risk of infection and osteomyelitis primarily. If treated

Table 5 The classification of injury types

	Isolated bone injury	Isolated soft tissue injury				Combined injury			
		Burn	Soft tissue trauma	Incision	Nail bed injury	Fracture + soft tissue trauma + nail bed injury	Fracture + nail bed injury	Fracture + incision	Soft tissue trauma + nail bed injury
No. patients, <i>n</i> (%)	326 (66.1%)	102 (20.7)	16 (3.3)	38 (7.7)	2 (0.4)	1 (0.2)	6 (1.2)	1 (0.2)	1 (0.2)
Total, <i>n</i> (%)	326 (66.1)		158 (32.1)				9 (1.8)		

Table 6 Distribution of hand injuries by seasons

Seasons	Age, <i>n</i> (%)					Total, <i>n</i> (%)
	<1	1–4	4–7	7–12	12–18	
Spring	5 (20.8)	27 (30.0)	15 (19.5)	36 (28.8)	65 (36.7)	148 (30.0)
Summer	6 (25.0)	14 (15.6)	29 (37.7)	32 (25.6)	32 (18.1)	113 (22.9)
Autumn	6 (25)	24 (26.7)	20 (26.0)	34 (27.2)	50 (28.2)	134 (27.2)
Winter	7 (29.2)	25 (27.8)	13 (16.9)	23 (18.4)	30 (16.9)	98 (19.9)

incorrectly malunion, growth arrest, and nail dystrophy may develop secondarily [23] (Fig. 6). In addition, sharp and penetrating injuries are encountered with the seizure of objects (glass cups, knives) left in the children's walking area. Hand tools must be kept out of the reach of children.

Children at this age carefully observe their parents' behavior, behave like the parents, and are prone to making mistakes. The child should be taught by his/her parents how to be careful at home. Among families with low socioeconomic status, raising awareness among parents about home accidents is important. There is a perception that such home accidents often occur when children are left alone at home [24]. Therefore, the parents of children should be held legally responsible for such injuries. New legal regulations may pave the way for irresponsible parents to be prosecuted with penalties. Children aged 4–6 years, also known as preschool or kindergarten children, are capable of running comfortably and navigating stairs. The scope of activity areas now extends all the way to the streets [25]. Children of this age are prone to injury by accidentally crushing their fingers when closing their home and school doors and sometimes windows. The age of 7–11 years is the primary school age in Turkey, and it can be considered a turning point in terms of hand and finger injuries. At this stage, there are more opportunities to get away from parents and play with friends. Therefore, the frequency of finger fractures increases with sports activities and because of hitting a ball on the street during primary school. Severe hand fractures in this stage can cause permanent loss of function and psychological trauma if untreated meticulously [26]. Including hand injuries in school-aged children's lectures to avoid accidents may reduce the frequency of these injuries. The 12–17 age period is the adolescence period; children tend to stand out themselves to their parents and friends, become aggressive, and get into fights more often. A study conducted at a hand center in

England showed 663 hand fractures in 100 000 children aged 10–16 years [27]. Similarly, in a study conducted in a university hospital in central Saudi Arabia, most of the hand fracture cases (46.2%) were in the 13- to 18-year age group [28].

The incidence of fifth metacarpal fracture increases because of punching in fights and arguments. These fractures include fifth metacarpal (neck) fractures reported by other authors as the most frequent fracture of the hand in teenagers [29,30]. To prevent the mistakes made during this period in adolescence, it may be beneficial for the school counselor to focus on these problem children.

Unfortunately, it was observed that burns frequently occur in very young children, especially in families with low socioeconomic status, through contact with domestic stoves and tea heated on these stoves. This finding is consistent with a previous report. Considering that all burns occur in the home, the importance of educating families and preparing the home environment (such as fencing the stove) for burn prevention strategies was reaffirmed. Parents should be educated to prevent finger injuries between doors and windows during the preschool period. A stopper can be placed on the door hinge or sponges placed under the door to prevent doors from fast closing. Various preventive products have been developed commercially and are readily available to limit the effect of finger crushing, such as a rubber cap attached to the hinge. In addition, parents should be informed to be cautious when closing the car doors and windows.

To prevent these injuries, it must be explained to the parents of these children that they are primarily responsible for accidents that occur at home.

Fractures were primarily observed in school children involved in sports and recreational (game) activities. These results were consistent with those of previous reports. In this study, there appeared to be a linearly proportional increase in the incidence of fractures after 6 years of age. In addition, the incidence of fracture increases because of the increase in contact sports activities as the upper classes pass.

The knowledge gained regarding the age-specific epidemiology of pediatric hand and finger injuries can benefit engineers and designers in developing safety measures to prevent these injuries for all children. Parents may

Fig. 6



Seymour fractures are displaced distal phalangeal physeal fractures with an associated nailbed injury seen mostly as a result of door jamming in pediatric patients.

Table 7 Injury prevention strategies by age

<1 year	Keep babies away from the stove (built a bar fence) especially in the countryside
1–3 years	Do not leave sharp objects such as glass cups in the children's walking area
4–6 years	Distribute stoppers that prevent full closing of doors and windows to families
7–11 years	Recovery of an injury in an athlete child without sequelae depends on early and correct intervention or seeking help from a specialist before it is too late
12–17 years	Children at this age need psychological support and therapy on anger management may be necessary

Table 8 The prioritization grouping of patients presenting to the emergency department

Subgroups of care		Type of injuries		
Emergent care	Incision	Nail bed injury	Flexor tendon injury	Burns
Urgent care	Fracture	Extensor tendon injury	Soft tissue injury	
Planned care	Soft tissue injury			

benefit from accident prevention training provided by family physicians. Because of the safety measures and the intensity of school sports activities, it may be beneficial to provide accident prevention by training coaches and school administrators (Table 7).

The patients presenting to the emergency department can be grouped according to the prioritization of care as shown in Table 8. This grouping is applicable for the treating physician. Not bringing the child to the doctor should be penalized for parents.

All these injuries can lead to sequelae. Late presentations to the physician should be considered as neglect, must be reported, and referred to the child abuse unit.

This study has some limitations. First, this was a retrospective study conducted in a single pediatric university hospital in Turkey. Therefore, it would not be appropriate to generalize the findings of this study to the general population. Second, this study covers children in a low-income region, so injury mechanisms may differ in different regions. Third, the children included in the study consisted of only the cases consulted with orthopedics and plastic surgery. More serious cases that were delivered directly to the orthopedic hand unit by ambulance and required absolute surgical exploration and repair were also not included. Although the study group is the only consulted group, it should not be forgotten that some pediatric hand injuries can be missed in the emergency department in daily practice. There are no standard protocols for expert referral in Turkey; referral is at the sole discretion of the treating physician. For this reason, minor cases treated by the pediatrician on an outpatient basis were ignored, and only cases in which experts were consulted were evaluated. The number of consultations will decrease as pediatricians gain experience in pediatric hand and finger injuries. Therefore, primary care physicians and pediatricians who treat hand and finger injuries should be familiar with hand anatomy and perform appropriate examinations before referral to specialized departments as needed. In this context, it is important to establish a training program to evaluate and treat hand and finger injuries for physicians performing primary care.

In addition to the economic cost of treatment, pediatric hand injuries cause social and functional losses and psychological problems in children. The findings of this study provide age-specific information about the anatomical parts, objects, activities, mechanisms, diagnosis, and treatment associated with hand and finger injuries. The strategy to prevent pediatric hand and finger injuries in

Turkey is primarily to inform healthcare professionals and parents and then to impose legal regulations and penal sanctions on irresponsible families.

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Conflicts of interest

There are no conflicts of interest.

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