

Changes in pediatric emergency department utilization and health literacy: a study of non-urgent visits before and after the COVID-19 pandemic

Catarina Cezanne^{1*}, Maria Filomena Cardoso², Zakhar Shchomak³, Rita Guerreiro¹,
Andreia Teixeira^{1,4,5,6,7}, Paula Pereira¹, Filipa Nunes¹, and Bruno Sanches¹

¹Serviço de Pediatria, Hospital Garcia de Orta, Almada; ²Unidade de Gastroenterologia e Hepatologia, Hospital Dona Estefânia, Centro Hospitalar Universitário Lisboa Central, Lisboa; ³Serviço de Pediatria, Hospital de Santa Maria, Lisboa; ⁴Department of Community Medicine, Information and Decision in Health; Faculty of Medicine, University of Porto, Porto; ⁵CINTESIS@RISE - Center for Health Technology and Services Research, Porto; ⁶Faculty of Medicine, University of Porto, Porto; ⁷ADiT-LAB, Instituto Politécnico de Viana do Castelo, Rua Escola Industrial e Comercial Nun'Álvares, Viana do Castelo, Portugal

Abstract

Introduction and objectives: The overuse of emergency rooms puts strain on the National Health Service. The aim is to compare the pre- and post-pandemic reality and understand the impact on hospital resource consumption. **Methods:** A cross-sectional observational study was conducted on patients under 18 years of age admitted to the emergency department, who were classified as non-urgent or urgent, and a questionnaire was randomly distributed during triage. **Results:** A study of 511 questionnaires revealed no significant differences in sample profiles between the two time periods. The most common family type was nuclear, with an older child and regular health monitoring. The most concerning symptom was fever, leading to emergency room visits in under 48 hours with no prior medical observation. The primary reasons for emergency room visits were specialist observation and testing requirements. Approximately 30% of doctors thought the visit was justified. **Discussion:** Regardless of their experience and regular health monitoring, the families chose to go to the emergency room first and almost immediately. A third of the doctors thought that going to the emergency room was justified, but only a minority of the children needed interventions that would have justified going to the emergency room. To improve the rational use of the emergency room, increased awareness of health resources should be promoted amongst families and health professionals. Despite the pandemic and the decrease in emergency room visits during that time, the population's behavior has remained consistent, and literacy issues remain unresolved. To intervene in health education, new strategies must be developed.

Keywords: Overuse. Pediatric emergency. COVID-19. Health education.

Mudanças na utilização do departamento de emergência pediátrica e literacia em saúde: um estudo sobre visitas não urgentes antes e depois da pandemia de COVID-19

Resumo

Introdução e objetivos: A sobreutilização das urgências constitui um motivo de desgaste do Serviço Nacional de Saúde. Pretende-se comparar a realidade pré e pós-pandémica e perceber o impacto no consumo dos recursos hospitalares. **Métodos:** Estudo observacional transversal. Inclui utentes até aos 18 anos admitidos na urgência, triados como pouco e não

*Correspondence:

Catarina Cezanne

E-mail: catarinacezanne@gmail.com

Received: 02-03-2024

Accepted: 16-12-2024

<https://pjp.spp.pt>

Available online: 30-05-2025

Port J Pediatr. 2025;56(4):206-216

DOI: 10.24875/PJP.24000031

2184-3333 / © 2024 Portuguese Society of Pediatrics. Published by Permayer. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

urgentes. Questionário distribuído aleatoriamente na triagem. **Resultados:** Incluídos 511 questionários. Sem diferenças significativas no perfil das amostras estudadas nos 2 períodos. A tipologia familiar predominante foi nuclear, com um filho mais velho e vigilância de saúde regular. O sintoma mais preocupante foi febre, motivando a ida à urgência em menos de 48 horas, a maioria sem observação médica prévia. Os motivos mais frequentes para o recurso à urgência foram a observação por um especialista e necessidade de exames. Cerca de 30% dos médicos considerou a vinda justificada. **Discussão:** Apesar das famílias serem experientes e terem vigilância regular de saúde, escolheram primeiramente e quase de forma imediata recorrer à urgência. Cerca de um terço dos médicos considerou a vinda à urgência justificada, no entanto apenas uma minoria das crianças necessitou das intervenções, que poderiam justificar o recurso à urgência. A literacia para a saúde das famílias e dos profissionais de saúde deve ser uma estratégia para melhorar o recurso racional à urgência. Apesar da pandemia e da redução da afluência à urgência nesse período, o comportamento da população manteve-se semelhante e os problemas de literacia continuam por resolver. É necessário encontrar novas estratégias para intervir na educação para a saúde.

Palavras-chave: Sobreutilização. Urgência pediátrica. COVID 19. Educação para a saúde.

Keypoints

What is known

- Emergency room overcrowding is a stressful issue for the National Health Service.
- Most patients who go to the pediatric emergency room do not need this level of care.
- During the COVID-19 pandemic, there was a massive reduction in emergency room visits following multiple health information campaigns.

What is added

- The behavior of the population was similar in the pre- and post-pandemic periods.
- Patients who come to the emergency room most often belong to nuclear families with educated parents, older children, and regular health monitoring.
- It is essential that we train caregivers in the self-management of common pediatric symptoms such as fever, cough, and vomiting.

Introduction

The overuse of hospital emergency rooms is a cause of wear and tear on the National Health Service (NHS). Understanding the concept of an urgent situation and, consequently, the reasons for resorting to the emergency room is essential for its proper use. An urgent event is characterized by a clinical situation of sudden onset with a risk of failure of vital functions. At least 50% of people who use a hospital emergency room do not need this level of care¹. This has a negative impact on the quality and even the personalization of the care offered to users who really need it. These figures are even more significant in pediatric emergency departments nationwide, with around 60,000 admissions a year per hospital catchment area^{2–5}. To better characterize this volume of admissions, we need to know the level of health literacy in recognizing clinical warning signs and the socio-family background of those accompanying children who come to the hospital emergency room.

The Pediatric Emergency Department (PED) at Hospital Garcia de Orta (HGO) is a multipurpose emergency department. It admits children and adolescents up to the age of 18 (exclusive). The average number of admissions per year from 2015 to 2018 was 47,950.

During the time of the COVID-19 pandemic (2019–2021), like other specialties, there was a massive reduction in access to the PED HGO. The number of admissions to the PED HGO in 2020 was 17,877 (a 63% reduction). A greater number of children were referred, mainly through the SNS 24 Health Line.

In 2017 (prior to the COVID-19 pandemic), an observational study was carried out at the HGO Pediatrics Department on non-urgent access to the PED. The aim of this study is to compare the current situation (post-COVID-19 pandemic) with that of 2017 in order to understand the evolution of the reasons for coming to the emergency room, the sociodemographic background, and the impact of the pandemic on the consumption of hospital resources.

Methods

This cross-sectional observational study took place in two different periods. The original study was carried out from January to March 2017. The team of authors decided to replicate the study to assess the impact of the pandemic on emergency room use. The second period ran from December 2021 to May 2022. This period required more time to acquire a comparable sample due to lower compliance in the distribution and

completion of questionnaires. The study's target population consisted of users of the PED. Children up to and including the age of 17 admitted to the HGO's PED and triaged as not very urgent (green wristband) or non-urgent (blue wristband) according to the triage systems in place at the time (the Canadian Triage and Acuity Scale for the former and the Manchester Triage System for the latter) were included. Cases in which the questionnaire was not filled out clearly or where the companion had already answered the questionnaire during the study period were excluded.

The study involved applying the questionnaire developed specifically for this purpose, previously approved by the HGO Ethics Committee (Supplementary data). Informed consent was obtained from the participants. The questionnaires were distributed at the time of triage during the PED's 24 hours of operation after randomizing the periods in Microsoft Office Excel®. The function "＝RANDBETWEEN" was used, randomizing the days of the month from one to 31, and the periods of the day with one (morning), two (afternoon), and three (evening). The questionnaires were filled out by the children's and young people's caregivers. The doctor who had examined the child filled out a second questionnaire (Supplementary data), independent of the questionnaire from the companions, in which they classified the visit to the hospital emergency room as justified or unjustified based on their clinical judgment.

Socio-demographic variables were collected, relating to the child (date of birth, age, and gender), the companion (degree of relationship and age), the parents (age, education, profession, employment status), the siblings (total number of siblings, age), and the child's environment (number of cohabitants, family type, place where the child or adolescent spends the day, place where child and adolescent health surveillance is carried out, health center to which they belong, and whether or not they have a general practitioner). Clinical data was also collected, namely personal history of chronic illnesses as well as usual attitudes towards illness and ways of using health services. The medical questionnaire looked at the following: the origin of the referral; the number of previous emergency episodes; diagnostic tests; intravenous therapy; observation by other specialists; the need for hospitalization; and the final diagnosis.

The data was analyzed using SPSS v27®. The qualitative variables were described by absolute and relative frequencies, *n* (%). Normally distributed continuous variables were described by their mean and standard

deviation, *M* (SD). Non-normally distributed continuous variables were described by the median and respective interquartile range, *M* [Q1; Q3]. The normality of the variables was assessed by graphical observation of the respective histograms. The relationship between categorical variables was checked using the chi-square test or Fisher's exact test, depending on whether the assumption of the chi-square test was met. The t-test for two independent samples was used whenever the variables were continuous and normally distributed. If this was not the case, the Mann-Whitney test was used. Values of $p \leq 0.005$ were considered significant.

Results

The results refer to both study periods, the first in 2017 (period 1) and the second in 2021–2022 (period 2). In the first period, 340 questionnaires were distributed, 297 of which were included and 43 excluded. In the second period, 250 questionnaires were distributed, of which 214 were included and 36 excluded.

Sociodemographic characteristics (Tables 1 and 2)

There were no significant differences in the sociodemographic characteristics of the children between the two study periods. The median age of the child was five in both samples, and the gender distribution was similar. As for the companion, the average age was 36 in both periods, but in the first, the children were predominantly accompanied by the mother (55%) or both parents (31%), while in the second, the mother was the main companion (89%) ($p < 0.001$).

When it came to characterizing the family, there was a statistically significant difference in the maternal level of education between the two periods, with a higher frequency of secondary and higher education ($p = 0.020$). With regard to employment, the tertiary sector was the most common in both samples, and there was a decrease in the paternal unemployment rate ($p = 0.045$) and a downward trend in the maternal unemployment rate in the second period ($p = 0.565$). The nuclear family was the most representative type in both samples, and the average number of cohabitants was three in both periods.

Regarding the place where the child spent most of their day, there was a predominance of nurseries and other establishments (schools) in both periods.

Table 1. Sociodemographic characterization of the patient, their companion and the environment

Variables	2017 (n = 298)	2021 (n = 221)	p
Sex, n (%)	n = 297	n = 214	
Female	157 (52,9)	111 (51,9)	
Male	140 (47,1)	103 (48,1)	0,049 ^{a,*}
Age, Med [Q ₁ ; Q ₃]	n = 292, 5 [2; 9]	5 [2; 10]	0,410 ^b
Child's companion, n (%)	n = 290	n = 218	
Father	29 (10,0)	18 (8,3)	
Mother	159 (54,8)	194 (89,0)	
Both	91 (31,4)	4 (1,8)	
Other	11 (3,8)	2 (0,0)	< 0,001 ^{a**}
Age of the child's companion, M (sd)	n = 266, 36,7 (8,5)	n = 217, 36,4 (8,0)	0,736 ^c
Siblings, n (%)	n = 294	n = 214	
Yes	194 (66,0)	148 (69,2)	
No	100 (34,0)	66 (30,8)	0,503 ^a
No. of siblings, Med [Q ₁ ; Q ₃]	n = 191, 1 [1; 2]	n = 143, 1 [1; 2]	0,330 ^b
Older siblings, n (%)	n = 187	n = 141	
Yes	146 (78,1)	112 (79,4)	
No	41 (21,9)	29 (20,6)	0,787 ^a
Younger siblings, n (%)	n = 187	n = 141	
Yes	61 (32,6)	46 (32,6)	
No	126 (67,4)	95 (67,4)	1,000 ^a
No. of cohabitants, M (sd)	n = 294, 2,9 (1,1)	n = 187, 3,0 (1,2)	0,239 ^c
Type of family, n (%)	n = 296	n = 214	
Enlarged	37 (12,5)	32 (15,0)	
Single parent	32 (10,8)	31 (14,5)	
Nuclear	213 (72,0)	148 (69,2)	
Reconstituted	14 (4,7)	3 (1,4)	0,103 ^a
Stay with, n (%)	n = 288	n = 200	
Mother/father or grandparents	72 (25,0)	51 (25,5)	
Kindergarten	193 (67,0)	109 (54,5)	
Others	23 (8,0)	40 (20,0)	< 0,001 ^{a,*}

^aChi-square test.^bMann-Whitney test.^cT-test for 2 independent samples.^dFisher's exact test.

*Significant at 5%.

Accessibility to health services (Table 3)

With regard to the child's or adolescent's health surveillance in both periods, the majority usually routinely visited the Healthcare Center (62.8% vs. 60.7%), a private pediatrician (15.0% vs. 13.1%), or both (20.5% vs. 23.8%). It was also found that the majority had an assigned family doctor (80% vs. 76%, respectively). A minority of the sample had a chronic illness (8.0% vs. 12.7%, $p = 0.120$).

Usual attitudes toward illness and patterns of use of health services (Tables 4 and 5)

When faced with questions related to the child's health, most caregivers said they would first ask their doctor in

both periods (77.5% vs. 71.0%, $p = 0.102$), and secondly, the nurse at the health center (27.9% vs. 29.9%, $p = 0.625$).

As for the first course of action taken when they realize that the child is ill, the majority answered that they monitor the evolution of symptoms (63.4% vs. 71.0%, $p = 0.074$), and in second place, they contact the SNS 24 Health Line (30.5% vs. 29.4%). There was a statistically significant decrease in selecting the “go to the Healthcare Center” option in the second period (32.6% vs. 20.4%, $p = 0.003$).

In terms of the symptoms that prompted the visit to the emergency room, the most frequently reported were fever (37.9% vs. 33.5%), cough/nasal obstruction (35.6% vs. 32.1%), and vomiting (17.8% vs. 21.3%). There were no significant differences between the two

Table 2. Sociodemographic characterization of caregivers

Variables	2017 (n = 298)	2021 (n = 221)	p
Mother			
Age, M (sd)	n = 288, 35,7 (7,0)	n = 215, 36 (7,7)	0,679 ^c
Level of education, n (%)	n = 277	n = 200	0,006 ^{a,*}
9th grade or less	105 (37,9)	50 (25,0)	
10th to 12th	96 (34,7)	93 (46,5)	
Higher education	76 (27,4)	57 (28,5)	
Profession, n (%)	n = 232	n = 167	0,637 ^d
Primary	1 (0,4)	0 (0)	
Secondary	3 (1,3)	5 (3,0)	
Tertiary	226 (97,4)	161 (96,4)	
Student	2 (0,9)	1 (0,6)	
Unemployed, n (%)	n = 235	n = 137	0,565 ^a
Yes	78 (33,2)	41 (29,9)	
No	157 (66,8)	96 (70,1)	
Father			
Age, M (sd)	n = 266, 38,2 (7,3)	n = 174, 38,4 (7,7)	0,763 ^c
Level of education, n (%)	n = 254	n = 163	0,223 ^a
9th grade or less	116 (45,7)	61 (37,4)	
10th to 12th	109 (42,9)	78 (47,9)	
Higher education	29 (11,4)	24 (14,7)	
Profession, n (%)	n = 233	n = 144	0,637 ^d
Primary	3 (1,3)	2 (1,4)	
Secondary	50 (21,5)	29 (20,1)	
Tertiary	177 (76,0)	112 (77,8)	
Student	1 (0,4)	0 (0)	
Retired	2 (0,9)	1 (0,7)	
Unemployed, n (%)	n = 214	n = 101	0,045 ^{a,*}
Yes	32 (15,0)	7 (6,9)	
No	182 (85,0)	94 (93,1)	

^aChi-square test.^bMann-Whitney test.^c2 sample t-test.^{*}Significant at 5%.

periods. In both cases, the symptom that worried parents the most was fever (13.6% vs. 22.8%). With regard to the length of time symptoms lasted until they were admitted to the hospital, 54% of the children had been ill for less than 48 hours in the first period, while in the second period this percentage was 70% ($p = 0.008$). There was no statistically significant difference in the severity of the episode, but most parents considered their children's situation to be urgent (57.9% vs. 55.7%).

Most of the children in our sample had not undergone any medical observation prior to going to the emergency room (77.9% vs. 82.8%). When asked why they went to the hospital emergency room, observation by a specialist was the most frequent answer in both

periods (34.9% vs. 32.6%) and also the one they considered most important. Other common answers were: having been referred (22.8% vs. 31.7%, $p = 0.027$); not being able to get a same-day appointment (25.2% vs. 21.7%); and the possible need for complementary tests at the hospital (21.8% and 28.5%).

Perspective on health services (Table 6)

Regarding the priority given in triage, in the first period, most patients were triaged as non-urgent, while in the second period, most patients were triaged as not very urgent ($p = < 0.001$). The SNS 24 Health Line was responsible for around 60% of the children who were referred in both periods. Most patients did not need

Table 3. Accessibility to health services

Variable	2017 (n = 298)	2021 (n = 221)	p ^a
Child health surveillance, n (%)	n = 293	n = 214	0,742
Doctor assigned, n (%)	n = 287	n = 206	0,222
No	56 (19,5)	50 (24,3)	
Yes	231 (80,5)	156 (75,7)	
Known chronic disease, n (%)	n = 263	n = 204	0,120
No	242 (92,0)	178 (87,3)	
Yes	21 (8,0)	26 (12,7)	

^aChi-square test.

complementary tests (83.2% vs. 82.8%), intravenous therapy (99.0% vs. 99.5%), or observation by another specialty (96.0% vs. 96.8%). No patients were hospitalized during the study periods. The five most frequent diagnoses in both periods were: acute gastroenteritis, acute nasopharyngitis, acute tonsillitis, acute otitis media, and acute pain due to trauma. Around 30% of the doctors considered their visit to be justified. For this reason, a sub-analysis was carried out on the cases that were considered justified, and the main diagnoses were similar: acute gastroenteritis, acute otitis media, acute tonsillitis, acute pain due to trauma, and acute nasopharyngitis.

Discussion

Overall, there were no significant differences in the profiles of the samples studied in the pre- and post-COVID-19 periods. The experience of a particular period in history, with relevant restrictions, lockdowns, and information in the media about the seriousness of the diseases, apparently did not change the paradigm of misuse of hospital emergency rooms. Notwithstanding the reduction in the number of emergency episodes seen in the first months of the COVID-19 pandemic^{6,7}, with a reduction in episodes with low-priority triage⁸, there was a progressive increase in the use of hospital emergency rooms in the following months. Several factors have been pointed out, including difficulties in accessing primary health care^{9,10} and inadequate referrals from the SNS 24 Health Line¹¹. However, it may also correspond to an increase in cases of inappropriate use of hospital emergency services, with a return to the previous pattern of hospital resource consumption.

Socio-demographic profile of companions

In a more specific assessment, it is important to discuss some particular aspects. In the population under

study, we found that factors such as single-parent families, first child, or a smaller support network, seen as potentially responsible for greater use of hospital emergency services^{12,13}, were not the most prevalent in this sample. In both periods, there was a greater representation of nuclear families: parents with a median age of 36 years, a higher level of education, and an older child. Despite the improving trend in education and unemployment rates between the two study periods, this did not translate into a reduction in the unjustified use of hospital emergency services. It could be inferred that structural changes with an impact on health literacy have not yet taken place.

Accessibility to health services

Lack of accessibility to primary health care has historically been cited as a reason for resorting to hospital emergency services^{2,10,12,14,15}. However, in the samples studied, only 2% had no regular medical follow-up. The majority had their own family doctor; around a third had a pediatrician, and a fifth of the sample had both. It should also be noted that children with chronic illnesses accounted for only around 10% of the sample in both periods.

The lower use of health centers could be explained by the conditioned care in primary health care that was prolonged in the second study period due to the COVID-19 pandemic. There was also a statistically significant increase in cases referred to the pediatric emergency room by other health services, namely the SNS 24 Health Line. This data could support the notion that the misuse of hospital emergency rooms in the post-pandemic period was also due to the difficulty in accessing primary health care and the referral criteria of the SNS 24 Health Line¹¹.

It is also worth mentioning in this context the recent creation of the so-called green lanes in Almada and Seixal, which include care for children without a family doctor, as a response to be developed when faced with acute illness.

Table 4. Attitudes towards acute illness and pattern of use of health services

	2017 (n = 298)	2021 (n = 221)	p ^a
What do you do when you have questions about your child's health?, n (%)			
Searches for information on the internet, in books or other audiovisual media	68 (22,8)	39 (17,6)	0,156
Talks to family, friends, or neighbors	51 (17,1)	41 (18,6)	0,728
Consults to pharmacists	51 (17,1)	34 (15,4)	0,633
Speaks with the nurse at the healthcare center	83 (27,9)	66 (29,9)	0,625
Seeks advice from their family doctor or pediatrician	231 (77,5)	157 (71,0)	0,102
Other	50 (16,8)	28 (12,7)	0,215
What do you do first when you realize that your child is ill?, n (%)			
Monitor the evolution of symptoms	189 (63,4)	157 (71,0)	0,074
Start the medication that seems most appropriate to you	42 (14,1)	20 (9,0)	0,100
Call the SNS 24 Health Line	91 (30,5)	65 (29,4)	0,847
Visit the healthcare center	97 (32,6)	45 (20,4)	0,003*
Consult the pediatrician	43 (14,4)	32 (14,5)	1,000
Take the child to the pediatric emergency room	72 (24,2)	50 (22,6)	0,754
Why did you bring him to the emergency room?, n (%)			
I was referred	68 (22,8)	70 (31,7)	0,027*
My healthcare center is closed	65 (21,8)	41 (18,6)	0,380
I don't have a family doctor	27 (9,1)	32 (14,5)	0,069
I couldn't get an appointment today	75 (25,2)	48 (21,7)	0,404
I don't trust my family doctor	7 (2,3)	6 (2,7)	1,000
I want the child to be seen by a specialist	104 (34,9)	72 (32,6)	0,639
I want a second opinion	14 (4,7)	14 (6,3)	0,437
I believe tests are needed that are only available in a hospital	65 (21,8)	63 (28,5)	0,099
Because it's free	9 (3,0)	7 (3,2)	1,000
Because it's the closest facility	27 (9,1)	22 (10,0)	0,763
Because the service is faster	17 (5,7)	13 (5,9)	1,000
Because I believe the illness is serious and urgent	26 (8,7)	30 (13,6)	0,087
Because I don't know how to manage this illness	19 (6,4)	18 (8,1)	0,492
Because family or friends advised me to come	9 (3,0)	10 (4,5)	0,479
Because the school/kindergarten recommended I come	24 (8,1)	15 (6,8)	0,618
Other	33 (11,1)	15 (6,8)	0,125
Which of the above reasons do you consider most important? (n = 241; 159), n (%)			
I was referred	36 (14,9)	33 (20,8)	NA
My healthcare center is closed	24 (10,0)	7 (4,4)	
I don't have a family doctor	6 (2,5)	7 (4,4)	
I couldn't get an appointment today	23 (9,5)	8 (5,0)	
I don't trust my family doctor	0 (0)	1 (0,6)	
I want my child to be seen by a specialist	54 (22,4)	34 (21,4)	
I want a second opinion	3 (1,2)	0 (0)	
I believe tests are needed that are only available in a hospital	45 (18,7)	31 (19,5)	
Because it's free	1 (0,4)	1 (0,6)	
Because it's the closest facility	2 (0,8)	3 (1,9)	
Because the service is faster	4 (1,7)	2 (1,3)	
Because I believe the illness is serious and urgent	13 (5,4)	16 (10,1)	
Because I don't know how to deal with this illness	7 (2,9)	8 (5,0)	
Because family or friends advised me to come	1 (0,4)	1 (0,6)	
Because the school or kindergarten recommended it	5 (2,1)	1 (0,6)	
Other	17 (7,1)	6 (3,8)	

^aChi-square test.

*Significant at 5%.

NA: not applicable.

Attitudes towards acute illness

The analysis of the sample also shows the immediacy of resorting to hospital emergency services. More than 60% of caregivers reported monitoring the progress of symptoms when their child became ill. However, in the first period of the study, around 60% of the children had

been ill for less than 48 hours. In the second period, this trend worsened and was statistically significant, with 70% of the children having been ill for less than 48 hours.

Answering the question, "What do you do when you have questions about your child's health?", despite the fact that the most common response was "go to the

Table 5. Patient’s current symptoms and their duration

	2017 (n = 298)	2021 (n = 221)	p ^a
What are the child’s current symptoms?, n (%)			
Fever	113 (37,9)	74 (33,5)	0,310
Cough/nasal congestion	106 (35,6)	71 (32,1)	0,454
Difficulty breathing	40 (13,4)	19 (8,6)	0,095
Sore throat	46 (15,4)	31 (14,0)	0,709
Earache	35 (11,7)	18 (8,1)	0,191
Skin rash	31 (10,4)	23 (10,4)	1,000
Vomiting	53 (17,8)	47 (21,3)	0,368
Diarrhea	35 (11,7)	37 (16,7)	0,123
Stomach pain	50 (16,8)	39 (17,6)	0,815
Headache	38 (12,8)	25 (11,3)	0,684
Trauma/fall	29 (9,7)	26 (11,8)	0,474
Other	49 (73,1)	40 (69,0)	0,693
Which symptom worries you the most? (n = 199; 162), n (%)			
Fever	27 (13,6)	37 (22,8)	0,413
Cough/nasal congestion	17 (8,5)	7 (4,3)	
Difficulty breathing	11 (5,5)	8 (4,9)	
Sore throat	9 (4,5)	5 (3,1)	
Earache	20 (10,1)	9 (5,6)	
Skin rash	16 (8,0)	16 (9,9)	
Vomiting	18 (9,0)	17 (10,5)	
Diarrhea	4 (2,0)	2 (1,2)	
Stomach pain	13 (6,5)	14 (8,6)	
Headache	3 (1,5)	3 (1,9)	
Trauma/fall	21 (10,6)	16 (9,9)	
Other	40 (20,1)	28 (17,3)	
How long has this symptom lasted?, n (%)			
< 12h	45 (16,5)	55 (26,6)	0,008*
12-24h	60 (22,1)	48 (23,2)	
24-48h	43 (15,8)	42 (20,3)	
2-7 days	90 (33,1)	43 (20,8)	
1-2 weeks	17 (6,3)	12 (5,8)	
> 2 weeks	17 (6,3)	7 (3,4)	
How serious do you think the current situation is?, n (%)			
Not urgent	15 (5,8)	19 (9,4)	0,434
Not very urgente	84 (32,4)	66 (32,5)	
Urgent	150 (57,9)	113 (55,7)	
Very urgent	10 (3,9)	5 (2,5)	
Was the child seen by another doctor before going to the emergency room?, n (%)			
Yes	60 (22,1)	36 (17,2)	0,207
No	212 (77,9)	173 (82,8)	
If yes, by whom?, (n = 96), n (%)			
Family doctor	35 (59,3)	25 (71,4)	0,221
Pediatrician	8 (13,6)	6 (17,1)	
Other	16 (27,1)	4 (11,4)	

^aChi-square test.

*Significant at 5%.

family doctor or pediatrician,” only 20% of the children had been seen by a doctor before being seen in the emergency room. This data suggests that regardless of the existence of a support network, most caregivers chose to go to the pediatric emergency room first. When asked about the “first course of action when they realize their child is ill,” there was a statistically significant decrease in selecting “go to the Healthcare Center”.

Among the reasons that seem to have had the greatest influence on the decision to go to the emergency room in this study were observation by a specialist and the need for complementary diagnostic tests in both periods, findings that are similar to those of other reported studies⁴. These reasons should be strategic targets for resolving undue access to hospitals, with the aim of strengthening trust in primary health care.

Table 6. Perspective of health services

	2017 (n = 298)	2021 (n = 221)	p ^a
Triage, n (%)	n = 291	n = 186	
Blue	242 (83,2)	4 (2,2)	< 0,001 [*]
Green	49 (16,8)	178 (95,7)	
Yellow	0 (0)	4 (2,2)	
Referenced by, n (%)	n = 46	n = 17	
SNS 24 line	27 (58,7)	10 (58,8)	0,662 ^b
Pediatrician	4 (8,7)	0 (0)	
Healthcare center	15 (32,6)	7 (41,2)	
Non-referenced	252 (85)	204 (92)	
No. of previous emergency episodes, Med [Q1; Q3]	n = 276, 6 [2; 14]	n = 167, 4 [2; 10]	0,019 ^{c,*}
Performed complementary exams, n (%)			
No	248 (83,2)	183 (82,8)	0,906 ^a
Yes	50 (16,8)	38 (17,2)	
Did intravenous therapy, n (%)			
No	295 (99,0)	220 (99,5)	0,640 ^b
Yes	3 (1,0)	1 (0,5)	
Was seen by another specialty, n (%)			
No	286 (96,0)	214 (96,8)	0,646 ^a
Yes	12 (4,0)	7 (3,2)	
Hospitalized, n (%)			
No	298 (100,0)	221 (100,0)	NA
Yes	0 (0)	0 (0)	
Do you consider this visit justified, n (%)			
No	200 (67,1)	141 (63,8)	0,455 ^a
Yes	98 (32,9)	80 (36,2)	
Most frequent diagnoses, n (%)	n = 278	n = 173	
Acute gastroenteritis	35 (12,2)	37 (20,8)	0,037 ^{a,*}
Acute nasopharyngitis	52 (18,1)	17 (9,6)	
Acute tonsillitis	22 (7,6)	11 (6,2)	
Acute otitis media	20 (6,9)	9 (5,1)	
Acute pain due to trauma	9 (3,1)	6 (3,4)	
Acute conjunctivitis	8 (2,9)	4 (2,3)	
Chickenpox	6 (2,2)	6 (3,5)	
Abdominal pain	5 (1,8)	6 (3,5)	
Sprain	4 (1,4)	6 (3,5)	
Fever	8 (2,9)	1 (0,6)	
Other	109 (39,2)	70 (40,4)	
Most frequent diagnoses in visits considered justified n (%)	98 (100)	76 (95)	NA
Acute gastroenteritis	5 (5,3)	15 (20,5)	
Acute otitis media	9 (9,5)	5 (6,8)	
Acute tonsillitis	8 (8,4)	3 (4,1)	
Acute pain due to trauma	5 (5,3)	3 (4,1)	
Acute nasopharyngitis	5 (5,3)	2 (2,7)	

^aChi-square test.^bFisher's exact test.^cMann-Whitney test.^{*}Significant at 5%.

NA: not applicable.

Although around 60% of cases consider the situation to be urgent or very urgent, only around 10% mention the seriousness or urgency of the illness as one of the reasons for coming. The most common pediatric symptoms (such as fever, cough, and vomiting) continue to be the three main reasons that unduly bring children to

the emergency room. The perception of serious illness in low-severity situations, the use of emergency services within the first 48 hours of symptoms, and the identification of common symptoms in pediatric age show a lack of health literacy and immediacy in the search for a quick resolution to acute illness^{4,10,16}.

Perspective of health services

From the health services perspective, a significant proportion of the episodes in both study periods (32.9% vs. 36.2%, respectively) were considered justified. In an attempt to identify children categorized as non-urgent who could be referred for emergency observation, four questions were inserted into the questionnaire given to doctors. These questions revealed that less than 20% of patients underwent complementary diagnostic testing, less than 5% were seen by another specialty, only 1% underwent intravenous therapy, and no patients were hospitalized. After verifying that the total number associated with the aforementioned conditions did not correspond to all the cases considered by the doctors to be worthy of coming to the emergency room, we proceeded to analyze the diagnoses made in these cases. It was found that most of the diagnoses corresponded to non-urgent illnesses that could be managed at home and in primary health care. The doctor's degree of differentiation may have influenced this data, but the results suggest that doctors also lack literacy when it comes to the reasons for resorting to a hospital emergency room. Referral criteria should be strengthened, and investment should be made in the training of health professionals.

Limitations

The study has methodological limitations inherent to its observational nature, based on the application of surveys, with the possibility of bias in the information provided for various reasons: the possible influence of responses after information provided in triage or when returning to the emergency doctor; the possible preference for the most differentiated companion; the potential lack of representation of illiterate users; the subjectivity of the doctor's assessment of the justification for coming to the emergency room, as well as their differentiation. Another limitation is the change in the triage system between the study periods.

We are currently experiencing an increase in emergency department overcrowding due to a lack of human resources in hospitals and primary health care, which has resulted in fewer available emergency rooms and consultations. It would be interesting to extend this study to the present day in order to characterize existing health-care availability. However, the reality we are currently experiencing in healthcare is an extraordinary situation.

Conclusion

During the COVID-19 pandemic, there were multiple health information campaigns, particularly on the

reasons and risks of going to the emergency room and managing common symptoms at home. These campaigns resulted in a considerable overall reduction in the number of admissions. After the pandemic, it would have been expected that the population would maintain this behavior, going to the emergency room only in cases of serious illness.

However, in this study, we found that there were no significant differences in the samples studied. The users who make the most use of the emergency room belong to nuclear families with educated and employed parents, older children, and regular child health monitoring. Notwithstanding the improvement in education and employability indicators, there was no improvement in health literacy. Parents are afraid of common pediatric symptoms such as fever, coughing, and vomiting, which makes them go almost immediately to the pediatric emergency room, regardless of having a health support network in the community. These symptoms need to be given greater prominence in health education interventions, and confidence in using primary health care needs to be strengthened. A significant proportion of situations were considered by emergency doctors to be justified, which contributes to resorting to the emergency room as the main option. Training on hospital referral criteria needs to be reviewed and strengthened.

Despite the pandemic and the reduction in emergency room visits during this period, the population's behavior has remained similar, and health literacy problems remain unresolved. The aim should be to empower caregivers to self-manage their child's illness. Larger, prospective studies are needed to objectively demonstrate and quantify the impact of health education strategies on the consumption of hospital resources for the justified reorganization of health systems.

Supplementary data

Supplementary data are available at DOI: 10.24875/PJP.24000031. These data are provided by the corresponding author and published online for the benefit of the reader. The contents of supplementary data are the sole responsibility of the authors.

Author contributions

M. Filomena Cardosa: conception and design of the study; acquisition of data from patients, research studies and literature; analysis and interpretation of data from patients, research studies and literature; drafting the article; critical review of the article for important intellectual content; final approval of the version to be published; agreement to be accountable for the accuracy or integrity of the work.

Z. Shchomak: conception and design of the study; acquisition of data from patients, research studies and literature; analysis and interpretation of data from patients, research studies and literature; drafting the article; critical review of the article for important intellectual content; final approval of the version to be published; agreement to be accountable for the accuracy or integrity of the work. R. Guerreiro: conception and design of the study; acquisition of data from patients, research studies and literature; analysis and interpretation of data from patients, research studies and literature; drafting the article; critical review of the article for important intellectual content; final approval of the version to be published; agreement to be accountable for the accuracy or integrity of the work. A. Teixeira: analysis and interpretation of data from patients; drafting the article; critical review of the article for important intellectual content; final approval of the version to be published; agreement to be accountable for the accuracy or integrity of the work. P. Pereira: analysis and interpretation of data from patients; drafting the article; critical review of the article for important intellectual content; final approval of the version to be published; agreement to be accountable for the accuracy or integrity of the work. F. Nunes: conception and design of the study; analysis and interpretation of data from patients; drafting the article; critical review of the article for important intellectual content; final approval of the version to be published; agreement to be accountable for the accuracy or integrity of the work. B. Sanches: conception and design of the study; analysis and interpretation of data from patients; drafting the article; critical review of the article for important intellectual content; final approval of the version to be published; agreement to be accountable for the accuracy or integrity of the work.

Funding

None.

Conflicts of interest

None.

Ethical considerations

Protection of humans and animals. The authors declare that no experiments involving humans or animals were conducted for this research.

Confidentiality, informed consent, and ethical approval. The authors have followed their institution's confidentiality protocols, obtained informed consent from patients, and received approval from the Ethics Committee. The SAGER guidelines were followed according to the nature of the study.

Declaration on the use of artificial intelligence. The authors declare that no generative artificial intelligence was used in the writing of this manuscript.

References

1. Direção-Geral da Saúde. Rede de Referência Hospitalar de Urgência/ Emergência. 1st ed. Direção-Geral de Saúde, editor. Vol. 1. Lisboa: Gráfica Maiadouro; 2001. 1–24 p.
2. Martins M, Marques R, Sousa M, Valério A, Cabral I, Almeida F. Frequent users of the pediatric emergency department: To know, to intervene and to evaluate - A pilot study. *Acta Med Port.* 2020 May 1;33(5):311–7.
3. Costa V, França Santos J, Trindade E, Mota T, Clemente E, Carreiro E, et al. Avaliação dos Motivos de Vinda ao Serviço de Urgência. Vol. 28, *Acta Periatr. Port.* 1997.
4. Freitas AC, Moreira AR, Tomé S, Cardoso R. Motivos de recurso ao Serviço de Urgência Pediátrica. *Nascer e Crescer.* 2016;XXV(3).
5. Caldeira T, Santos G, Pontes E, Dourado R, Rodrigues L. O dia-a-dia de uma Urgência Pediátrica. *Acta Pediátrica Portuguesa.* 2006;1(37):1–4.
6. Entidade Reguladora de Saúde. INFORMAÇÃO DE MONITORIZAÇÃO Impacto da pandemia COVID-19 no Sistema de Saúde – período de março a junho de 2020 [Internet]. Porto, Portugal; 2020. Available from: <https://transparencia.sns.gov.pt>
7. Kostopoulou E, Gkentzi D, Papasotiriou M, Fouzas S, Tagalaki A, Varvarigou A, et al. The impact of COVID-19 on paediatric emergency department visits. A one-year retrospective study. *Pediatr Res.* 2022 Apr 1;91(5):1257–62.
8. Santana R, Rocha J, Soares P. A procura de serviços de urgência/ emergência hospitalar: tendências durante o primeiro mês de resposta à COVID-19. 2021.
9. Poppe M, Aguiar B, Sousa R, Oom P. The impact of the COVID-19 pandemic on children's health in Portugal: The parental perspective. *Acta Med Port.* 2021;34(5):355–61.
10. Rebelo CC, Sousa T. Obstacles to the Adequate Use of Pediatric Emergency Departments in Portugal. Vol. 33, *Acta Medica Portuguesa.* CELOM; 2020. p. 622.
11. Gonçalves R, Sá B, Cunha R, Winckler L, Moleiro P. Evaluation of the adequacy of the referral via a telephone health advice line to a pediatric emergency department during the COVID-19 pandemic in Portugal. Vol. 34, *Acta Medica Portuguesa.* CELOM; 2021. p. 312.
12. Kirby S, Wooten W, Spanier AJ. Pediatric Primary Care Relationships and Non-Urgent Emergency Department Use in Children. *Acad Pediatr.* 2021;XXX:1–7.
13. Herman A, Young KD, Dennis Espitia P, Fu N, Farshidi A. Impact of a Health Literacy Intervention on Pediatric Emergency Department Use. *Pediatric Emergency Care & [Internet].* 2009;25(7). Available from: www.pec-online.com
14. Poku BA, Hemingway P. Reducing repeat paediatric emergency department attendance for non-urgent care: A systematic review of the effectiveness of interventions. Vol. 36, *Emergency Medicine Journal.* BMJ Publishing Group; 2019. p. 435–42.
15. Neill S, Roland D, Thompson M, Tavaré A, Lakhanpaul M. Why are acute admissions to hospital of children under 5 years of age increasing in the UK? *Arch Dis Child.* 2018;103(10):917–9.
16. Costa V, França Santos J, Trindade E, Mota T, Clemente E, Carreiro E, et al. Avaliação dos Motivos de Vinda ao Serviço de Urgência. Vol. 28, *Acta Periatr. Port.* 1997.