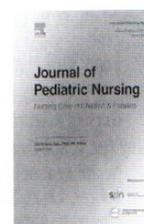




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## Factors associated with the inappropriate use of the pediatric emergency department. A systematic review

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### ABSTRACT

**Background:** Pediatric emergency department (PED) admissions have risen in recent years, a trend not justified by the severity of the pathologies presented. The aim of this study is to analyse factors related to the inappropriate use of pediatric emergency departments.

**Methods:** This is a systematic review reported in accordance with the PRISMA statement. We searched the PubMed, Web of Science and Science Direct databases, using keywords extracted from MeSH, and conducted a reverse search using Google Scholar and Open Grey, for the period January 2017 to August 2022. The quality of the papers was assessed using STROBE, CASPe, AMSTAR-2, GRADE, Levels Of Evidence and Grades Of Recommendation.

**Results:** A total of 20 studies were selected. Factors related to inappropriate use included the younger age of children, black caregivers, lower socioeconomic status, lower parental educational attainment, perceived urgent demand for care, parental emotions in response to their children's health problems, psychological distress, the ineffective exercise of the parental role, the advantages of the PED and the nature of health insurance.

**Conclusions and implications:** The results illustrate the heterogeneous nature of the phenomenon under investigation. Gaining an understanding of the factors related to the inappropriate demand of PEDs, from the perspective of health professionals, can help in developing interventions to reduce unnecessary consultations and relieve pressure on these healthcare services.

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### Introduction

The American Medical Association (AMA) defines the term urgency as: "any circumstance that, in the judgment of the patient, family or decision-maker, requires immediate medical intervention", while emergency is defined as: "that critical circumstance that places the patient's life in immediate danger". Therefore, the term urgency implies heterogeneity (different causes and degrees of severity) and includes both objective aspects (severity and acuity of the process) and subjective aspects (awareness of an imminent need for care), which give rise to the user's expectation of rapid attention and resolution (Jiménez, 2006).

In fact, due to the implicit subjectivity of the term urgency, the number of visits to emergency departments is on the rise (Gkentzi et al.,

2019; Keeble & Kossarova, 2017). The increased demand for emergency care, the overcrowding of emergency services and the inappropriate use of these services are issues common to most developed Western countries (Andrew et al., 2019; Campagna et al., 2020).

With regard to pediatric emergencies, there has also been a clear upward trend since 2010. In the European context, 23 million users sought care in pediatric emergency departments (PED) in 2019 (Ministry of Health, 2021). This is a complex situation to be faced with because, paradoxically, children have never been healthier (Al-Mahtot et al., 2018). In fact, a sizeable proportion of visits to PEDs could be adequately managed in less complex settings such as primary healthcare (PC) services. At the international level, various authors estimate that between 40% and 59% of emergency department visits could be managed and resolved in PC services (Cag et al., 2019; Neill et al., 2018; Unwin et al., 2016). This poses a major organisational and structural challenge for healthcare services in all countries. These services must make the appropriate changes, in line with national health policy, to address this multifactorial problem whereby emergency departments become overwhelmed due to increased demand, especially inappropriate demand from the perspective

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of health professionals (Martins et al., 2020; Watson & Blair, 2018). Users are therefore expected to make correct use of services, initially consulting PC services as the first level of care for non-urgent and urgent situations where, having been assessed by a physician, they can be referred to the PED if necessary (Barata et al., 2015).

Hospital emergency cases that could otherwise be dealt with in a PC setting lead to a whole host of negative repercussions, which makes this phenomenon a major public health issue. The negative repercussions described in the scientific literature include increasing costs, patient density, stressful conditions for healthcare staff and delays in the delivery of care (Unwin et al., 2016). All this means that less attention is given to genuinely urgent cases, creating dissatisfaction among both professionals and users. Staff suffer from burnout and users sometimes end up leaving these services without being examined by a doctor, putting their safety at risk and increasing patient morbidity and mortality (Burokienė et al., 2017; Unwin et al., 2016).

The scientific evidence to date shows that the demand for and inappropriate use of these services is associated with a number of factors. These include the child's age, a lack of trust in PC services, low parental health literacy, the influence of social networks, the lack of or difficulty in gaining rapid access to PC services and the perceived advantages of using the PED over other services, such as: hours of operation, accessibility, ease of diagnostic tests and consultation with specialists, among others (Neill et al., 2018; Watson & Blair, 2018). Knowledge of users' concerns and the different drivers of the demand for emergency department care is essential to providing the right response and being able to act on the main issues of concern to society, organising services on the basis of need and developing public health plans to cut the number of visits and inappropriate demand (Lara et al., 2014; Ramlakhan et al., 2016). Hence the importance of this research, which aims to analyse the sociodemographic, psychological, parental role, healthcare system and childhood health factors that are linked to the inappropriate use of PED care, giving a broader view of the current problem and exploring new parenting factors neither known to date nor identified in previous systematic reviews.

## Material and methods

### Design

This is a systematic review reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)

statement (Rethlefsen et al., 2021) and the PRISMA literature search extension (Page et al., 2021). We used an adapted PICOS (Participants, Interventions, Comparisons, Outcomes, and Study design) approach in PIO format (Methley et al., 2014): parents and pediatric patients seeking attention in the PED (P), identification of factors linked to the inappropriate use of the PED (I) and inappropriate use of the PED (O). The review protocol was registered in the Prospective International Register of Systematic Reviews (PROSPERO) with number CRD42022358995.

### Information sources

To identify relevant studies, we searched the Web of Science, Science Direct and PubMed electronic databases. Grey literature was retrieved through Open Grey and Google Scholar and a reverse search was conducted of the analysed articles. The search terms used varied by database and were a combination of keywords extracted from the Medical Subject Headings (MeSH) (Browser MeSH, 2021). Table 1 shows the search strategy, filters and descriptors according to each database used.

### Selection criteria

Articles that met the following criteria were included in the review: 1) where the study population was fathers, mothers and users seeking PED care, 2) studies of any type and 3) those published within the last five years. Exclusion criteria were established as: 1) articles focused on PC, the home and adults, 2) posters and editorials and 3) studies already appearing in earlier similar systematic reviews that have been included in this review.

### Selection process

The references retrieved were imported into the Rayyan QCRI web application (Ouzzani et al., 2016). Duplicates were removed by one reviewer (NMP), first using the programme's duplicate identification feature and then manually. Two reviewers (NMP and RML) then independently assessed the titles and abstracts of the retrieved records against the eligibility criteria, collecting the relevant information in an "ad hoc" document adapted from González et al. (2011). If a record appeared relevant to at least one of the reviewers, they both independently reviewed the full text of the article. Disagreements over inclusion and discrepancies between the two reviewers were discussed with a third reviewer (MRM).

**Table 1**  
Search strategy used in the review.

Database	Search String	Filters	Results
Web of Science	(((TS = (Psychosocial factors)) AND TS = (children)) OR TS = (pediatric)) AND TS = (parents) AND TS = (minor illness) OR TS = (non-urgent) AND TS = (health care utilization)	Last 5 years	80
	(((TS = (Psychosocial factors)) AND TS = (children)) OR TS = (pediatric)) AND TS = (parents) AND TS = (health care utilization)	Last 5 years	225
	(((TS = (Sociodemographic Factors)) AND TS = (children)) OR TS = (pediatric)) AND TS = (parents) AND TS = (health care utilization)	Last 5 years	236
Science Direct	((((((Psychosocial factors)) AND (children)) OR (pediatric)) AND (parents)) AND (minor illness)) OR (non-urgent) AND (health care utilization)	Last 5 years. Search for "Title, abstract, Key Words"	48
	(((Psychosocial factors)) AND (children)) OR (pediatric)) AND (parents) AND (health care utilization)	Last 5 years. Search for "Title, abstract, Key Words"	48
	(((Sociodemographic Factors)) AND (children)) OR (pediatric)) AND (parents) AND (health care utilization)	Last 5 years. Search for "Title, abstract, Key Words"	47
PubMed	((((((Psychosocial factors)) AND (children)) OR (pediatric)) AND (parents)) AND (minor illness)) OR (non-urgent) AND (health care utilization)	Last 5 years. Search for "All fields"	75
	(((Psychosocial factors)) AND (children)) OR (pediatric)) AND (parents) AND (health care utilization)	Last 5 years. Search for "All fields"	1652
	(((Sociodemographic Factors)) AND (children)) OR (pediatric)) AND (parents) AND (health care utilization)	Last 5 years. Search for "All fields"	1161

TS: Topic.  
Search as of: 07/08/2022.

The initial systematic search generated 3572 results. After applying the appropriate filters and discarding duplicate articles (1443) and those that did not meet the selection criteria (2096) we analysed 33 full-text articles, after which the number of results was reduced to 19. The screening process continued, and four studies were withdrawn, leaving 15 selected articles, to which five were added following the manual search. In the end, 20 articles were selected (Fig. 1).

Data extraction

A narrative data analysis was performed due to the heterogeneity of the selected articles (Popay et al., 2006). We extracted the following information from the articles: authors, country, study design, sample and type of intervention. The information obtained that met our study objective was then categorised on the basis of the following factors: socio-demographic, psychological, parental role, health care system-related and health status of the children seeking care.

Methodological quality assessment

Two authors (NMP and RML) assessed the quality of the papers, with disagreements being resolved by a third reviewer (MRM). Both NMP and RML have clinical, teaching and research experience in the pediatric emergency setting and MRM is a psychologist and senior research professor. The quality of the selected articles was determined using the Critical Appraisal Skills Programme Español (CASPe) (Long et al., 2020) for qualitative studies and Strengthening the Reporting of Observational studies in Epidemiology (STROBE) (Von Elm et al., 2008) for quantitative studies. Using CASPe and STROBE, items were classified as “weak” if they scored <33%, “moderate” from 34 to 66%, and “strong” for scores >66% (Solaz-García et al., 2022). AMSTAR-2 (Pizarro et al., 2021) was used for the systematic reviews. Levels Of evidence (LOE)

and Grades Of Recommendation (GOR) were also assessed, in line with the approach of The Joanna Briggs Institute (2019). Lastly, the quality of evidence for observational studies was evaluated using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach. This scale classifies articles into four levels of evidence: “high”, “moderate”, “low” and “very low” (Sanabria et al., 2015). No studies were excluded on the basis of the quality assessment in an effort to provide sufficient breadth of data from a range of sources.

Results

In total, 20 studies published between January 2017 and August 2022 were included in the review (Table 2). In terms of the country of origin of the studies, four (20%) were conducted in the United Kingdom (Barwise-Munro et al., 2018; Butun & Hemingway, 2017; Butun et al., 2018; McLauchlan et al., 2020), three (15%) in Turkey (Akbayram & Coskun, 2020; Kurt et al., 2020; Pehlivanurk-Kizilkan et al., 2022), four (20%) in the United States (Guyon-Harris et al., 2021; Pethe et al., 2019; Shi et al., 2020; Sojar et al., 2022), three (15%) in France (Canévet et al., 2018; Perret et al., 2017; Ravi et al., 2021), one (5%) in Sweden (Ellbrant et al., 2018), one (5%) in Australia (Alele et al., 2018), one (5%) in the Dominican Republic (Lockwood et al., 2019) and three (15%) in Spain (Expósito-Ruiz et al., 2017; Oliva & Oliva, 2017; Ortega-Benítez et al., 2019).

Thirteen studies (65%) used quantitative methods with an observational design (Akbayram & Coskun, 2020; Ellbrant et al., 2018; Expósito-Ruiz et al., 2017; Guyon-Harris et al., 2021; Kurt et al., 2020; Lockwood et al., 2019; Oliva & Oliva, 2017; Ortega-Benítez et al., 2019; Pehlivanurk-Kizilkan et al., 2022; Pethe et al., 2019; Ravi et al., 2021; Shi et al., 2020; Sojar et al., 2022), four (20%) used qualitative methods (Barwise-Munro et al., 2018; Canévet et al., 2018; McLauchlan et al.,

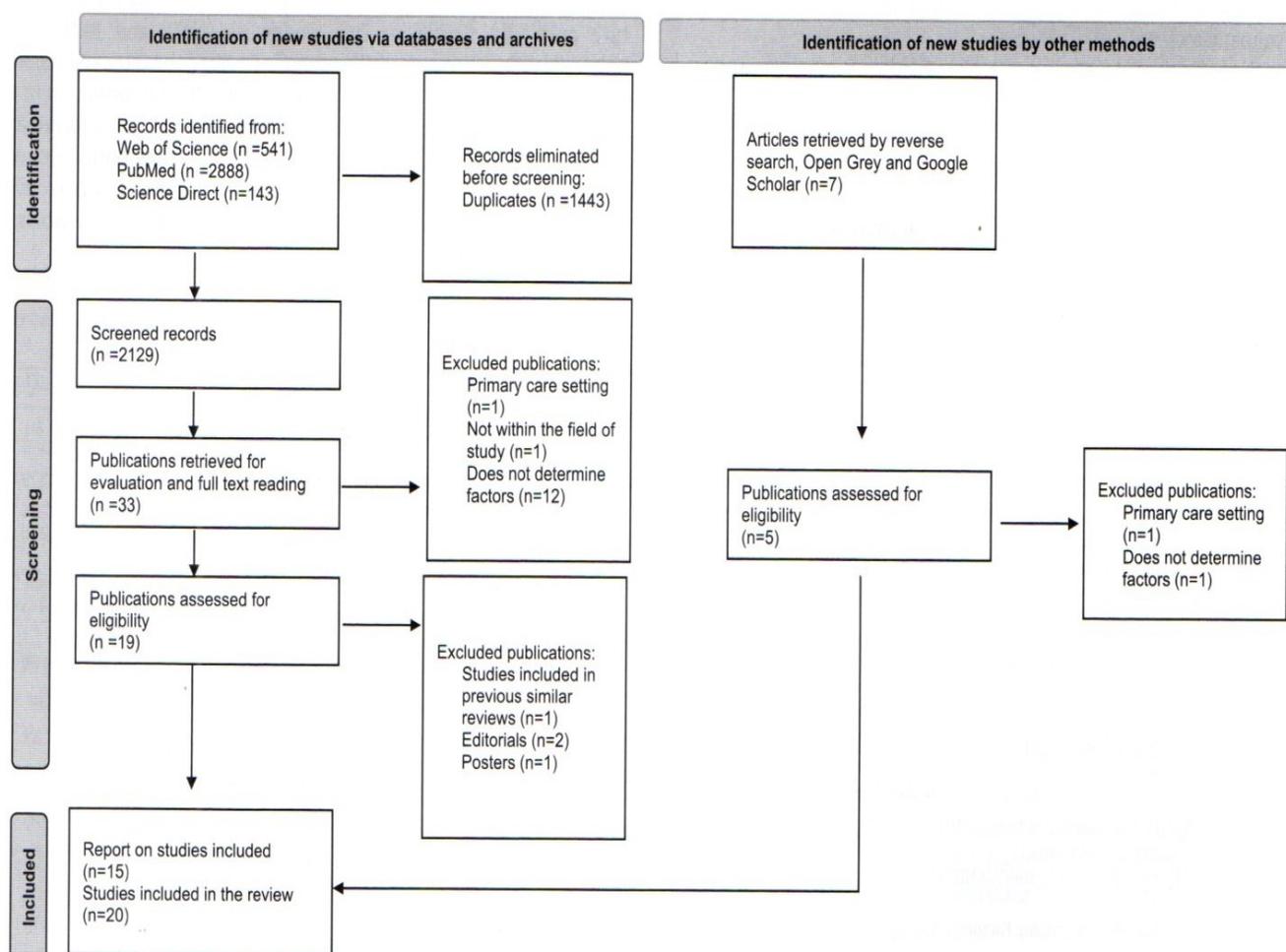


Fig. 1. Flowchart of the systematic review's article selection process.

**Table 2**  
Analysis and synthesis of the studies included in the review

Authors and (Year) COUNTRY Type of Study	Population (Sample)	Intervention	Outcome Variables	Results	Quality of the Paper
Akbayram & Coskun (2020) TURKEY Observational Study Descriptive Cross-sectional	<b>Sample:</b> 457 parents.	<b>Intervention:</b> Ad hoc survey.	Sociodemographic factors Psychological factors Healthcare system factors	-Parental educational attainment: Parents' level of education and preference for attending the PED versus other services ( $p = 0.014$ ). -Perceived Urgency: The feeling of urgency (17.3%) and the feeling that the child's condition is worsening (42.5%). -Operating hours: The family doctor is unavailable at the time (20.4%). -Satisfaction with services: A belief that PEDs provide a better and faster service than other healthcare services (19.9%).	STROBE:18/22 (Strong) LOE: 3e GOR: B GRADE: Very low
Alele et al. (2018) AUSTRALIA Systematic Review	<b>Sample:</b> 31 articles.	<b>Intervention:</b> Data analysis and quality assessment.	Sociodemographic factors Health care system factors	-Gender, educational attainment and nationality/ethnicity/parental race: Black ethnicity (3 articles) and lower parental educational attainment (3 articles). -Gender and patient age: Gender (2 articles) as a predisposing factor was inconsistent. Younger age of children (3 articles) as a consistent predisposing factor.  -Operating hours and characteristics of the service: Residing near the PED (2 articles), having a GP and out-of-hours visits (5 articles) due to the availability of the service. -Health insurance: (5 articles) Having a free public health system increases inappropriate use of the PED.	AMSTAR-2: Moderate LOE: 4a GOR: B
Barwise-Munro et al. (2018) UK Qualitative Study	<b>Sample:</b> 10 parents and 17 clinicians.	<b>Intervention:</b> Semi-structured qualitative interview.	Sociodemographic factors Psychological factors	-Non-regular caregivers: Caregivers (grandparents, etc.) may not know the child as well as the parents and may have a lower threshold for seeking care. -Perceived urgency: Parents attended the service because they believe "prevention is better than cure" and "err on the side of caution". -Parental emotions: Parental worry. Clinicians identify the feeling of "anxiety".	CASPe: 8/10 (Strong) LOE: 3e GOR: B
Butun et al. (2018) UK Mixed Systematic Review	<b>Sample:</b> 11 quanti. 11 quali. 2 mixed.	<b>Intervention:</b> Data analysis and quality assessment.	Psychological factors Health care system factors	-Perceived urgency: (17 articles), parental perceived urgency is a consistent factor. -Parental emotions: (8 articles), parents' need for reassurance. -Hours of operation and characteristics of the service: (17 articles), advantages of the emergency department (e.g. faster service, better resources than primary care and efficiency). (15 articles), speed, convenience and easy access (hours of operation) to services. -(4 articles), parents seeking a second diagnostic opinion. -(14 articles), problems with PC services. -Health insurance: (7 articles), lack of medical coverage identified.	AMSTAR-2: Moderate LOE: 4a GOR: B
Butun & Hemingway (2017) UK Qualitative Systematic Review	<b>Sample:</b> 4 qualitative articles.	<b>Intervention:</b> Thematic narrative analysis.	Psychological factors Parental role factors Health care system factors	-Parental emotions: -Concern for the child's health, delayed recovery, complications of illness, poor control, frustration, fear, anxiety (including hereditary diseases). -Reassurance and importance of the notion of parental responsibility. -Perceived urgency: Parents' perception of severity and belief that they would be referred to the PED by PC. -Exercising the parental role: Being a new parent. -Satisfaction with services: Dissatisfaction with PC and staff attitudes. -Hours of operation, characteristics of the service: -Advantages of using the PED: Most cited reasons (quality of care, facilities, lack of doctors/qualified staff in PC, efficiency, waiting time, speed, ease of obtaining results). -Difficulties in getting an appointment. -Inability to take time off work and PC hours of operation.	AMSTAR-2: Moderate LOE: 4a GOR: B
Canévet et al. (2018) FRANCE Qualitative Study	<b>Sample:</b> 17 parents.	<b>Intervention:</b> Semi-structured interviews.	Psychological factors Parental role factors	-Parental emotions: The level of anxiety related to the unusual or unexplained nature of the early symptoms, parental concerns and trust in the emergency department. Inappropriate visits to pediatric emergency departments may mask an implicit demand for urgent parental support.	CASPe: 8/10 (Strong) LOE: 3e GOR: B
Ellbrant et al. (2018) SWEDEN Observational Study Descriptive Cross-sectional	<b>Sample:</b> 657 parents of patients.	<b>Intervention:</b> Ad hoc survey.	Sociodemographic factors Psychological factors Healthcare system factors	-Parental economic status: Direct care-seeking was most prevalent in the city district with the lowest socioeconomic status ( $p = 0.008$ , $OR = 2.016$ ). -Perceived urgency: As the main reason for not trying to contact PC before seeking attention at the PED. -System characteristics: Disadvantages of and problems in the PC	STROBE:18/22 (Strong) LOE: 3e GOR: B GRADE: Low

(continued on next page)

Table 2 (continued)

Authors and (Year) COUNTRY Type of Study	Population (Sample)	Intervention	Outcome Variables	Results	Quality of the Paper
Expósito-Ruiz et al. (2017) SPAIN Observational Study Descriptive Cross-sectional	<b>Sample:</b> 5495 parents.	<b>Intervention:</b> Analysis of the NHS Minors Questionnaire.	Sociodemographic factors	service (40%). -Patient gender and age: Male gender (OR: 1.202; 95% CI: 1.047–1.381) was significantly and directly associated with higher attendance rates, while age was inversely associated (OR: 0.909; 95% CI: 0.894–0.924). -Parental educational attainment: Higher educational attainment (OR: 1.255, 95% CI: 0.983–1.603) was significantly and directly associated with attendance rates. -Nationality/ethnicity/parental race: A positive correlation was found between the use of PEDs and the presence of people from abroad ( $p = 0.031$ ).	STROBE:16/22 (Strong) LOE: 3e GOR: B GRADE: Very low
Guyon-Harris et al. (2021) USA Observational Study Analytical Prospective Longitudinal	<b>Sample:</b> 120 mothers.	<b>Intervention:</b> Assessment using CTQ-SF, MFP, PSS, EPDS, BSI-A, PCL	Sociodemographic factors Psychological factors Parental role factors Other factors	-Gender, age, educational attainment and parental economic status: The number of ED visits was not associated with maternal age, education or income-to-needs ratio. -Parental emotions: Prenatal mental health, symptoms of depression and anxiety ( $p = 0.03$ ). -Poor relational health (nurturing, responsive and supportive relationships) as a predictor. -Low perceived social support from family in relation to children's care needs. -Feelings of lower acceptance (increased rejection) by the childhood father figure, but not the mother figure. -History of abuse during childhood: In particular sexual abuse.	STROBE:19/22 (Strong) LOE: 3e GOR: B GRADE: Low
Kurt et al. (2020) TURKEY Observational Study Analytical Prospective	<b>Sample:</b> 1033 children classified as non-emergency.	<b>Intervention:</b> Ad hoc survey.	Sociodemographic factors Psychological factors Healthcare system factors	-Age and parental educational attainment: -Parents under the age of 30 preferred the convenience of the emergency department. -Trust in emergency staff was the most commonly cited reason for admission among parents with a primary education. -Perceived urgency: Parental concern about the progression of the child's condition. -Hours of operation, characteristics and satisfaction with services: -Dissatisfaction with daytime outpatient examinations, onset of the child's complaints outside working hours, inability to attend daytime visits due to work, lower participation fee following PED visits, shorter waiting time in the ED and faster test results ( $p = 0.005$ , $p = 0.032$ , $p = 0.007$ , $p = 0.026$ , $p = 0.002$ and $p = 0.001$ , respectively). -Satisfaction with services: Favourable welcome in the ED, perception of more attentive care in the ED ( $p = 0.047$ ; $p = 0.013$ ).	STROBE:18/22 (Strong) LOE: 3e GOR: B GRADE: Low
Lockwood et al. (2019) DOM. REP. Observational Study Descriptive Cross-sectional	<b>Sample:</b> 117 caregivers (mothers and fathers).	<b>Intervention:</b> Ad hoc survey.	Sociodemographic factors Psychological factors	-Parental educational attainment: Children of caregivers with any secondary education were 69% less likely to make four or more visits to the emergency department in the previous six months (OR: 0.31; 95% CI, 0.13–0.75; $p = 0.009$ ), compared to children of caregivers with no secondary education. -Perceived urgency: 72% of respondents reported the child's problem as "extremely urgent", while 82% of children were classified as non-urgent.	STROBE:18/22 (Strong) LOE: 3e GOR: B GRADE: Very low
McLauchlan et al. (2020) UK Qualitative Study	<b>Sample:</b> 13 parents.	<b>Intervention:</b> Semi-structured interviews.	Psychological factors Health care system factors	-Perceived urgency: The perception of the urgency or seriousness of a condition and uncertainty about their assessment of the seriousness or urgency of a problem. -Service characteristics: -Positive perceptions of the PED. -The resources available at the PED, the perceived expertise of the staff, trust in the system, the likelihood that a condition requires resources available only at the PED and dissatisfaction with alternative services. -Satisfaction with the service: The positive perception of the PED.	CASPe: 8/10 (Strong) LOE: 3e GOR: B
Ortega-Benítez et al. (2019) SPAIN Observational Study Descriptive Cross-sectional	<b>Sample:</b> 407 children's medical records.	<b>Intervention:</b> Analysis of MH.	Health care system factors	-Characteristics of the system and hours of operation: Speed in 88% of cases, availability of diagnostic resources in 82%, certainty of medical indications in 75%, hours of operation in 55% and proximity in 45%. -Hours of availability of the service (OR: 1.86; 95% CI, 1.01–3.46; $p = 0.049$ ).	STROBE:17/22 (Strong) LOE: 3e GOR: B GRADE: Very low
Oliva & Oliva (2017) SPAIN Observational Study Descriptive Cross-sectional	<b>Sample:</b> 1118 patients attending the PED in a rural hospital.	<b>Intervention:</b> Factor analysis.	Sociodemographic factors Health care system factors	-Patient's age: Age of the patient, the younger the child, the more difficult the diagnosis and thus greater demand in the PED. -Operating hours and characteristics of the system: There is a preference to be seen by a paediatrician and the unavailability of PC paediatricians in the afternoons, evenings and weekends leads to more visits to the PED.	STROBE:14/22 (Moderate) LOE: 3e GOR: B GRADE: Very low

Table 2 (continued)

Authors and (Year) COUNTRY Type of Study	Population (Sample)	Intervention	Outcome Variables	Results	Quality of the Paper
Pehlivanurk-Kizilkan et al. (2022) TURKEY Observational Study Descriptive Cross-sectional	<b>Sample:</b> 974 caregivers of patients attending the PED.	<b>Intervention:</b> Ad hoc survey.	Sociodemographic factors Psychological factors	-Parental employment status: Parental unemployment status ( $p = 0.038$ ). -Child age and characteristics: Child age group ( $p = 0.001$ ), the presence of a chronic illness ( $p = 0.020$ ) and a previous ED visit in the last week ( $p = 0.008$ ). -Perceived urgency: 68% of visits were non-urgent. Of these visits, 51.6% were perceived as urgent, and 11.5% as extremely urgent.	STROBE:18/22 (Strong) LOE: 3e GOR: B GRADE: Low
Pethe et al. (2019) USA Observational Study Descriptive Cross-sectional	<b>Sample:</b> 120 caregivers.	<b>Intervention:</b> Ad hoc survey.	Psychological factors Healthcare system factors	-Perceived urgency: Half of the parents (52.5%) thought their child's medical problem was serious. -Satisfaction with the service: Perception that the PED provides children with better care (26.8%). -Characteristics of the system: Perceived lack of access to PC (52.7%).	STROBE:17/22 (Strong) LOE: 3e GOR: B GRADE: Very low
Perret et al. (2017) FRANCE Qualitative Study	<b>Sample:</b> 21 mothers, 5 fathers, 1 grand-mother.	<b>Intervention:</b> Semi-structured interviews.	Psychological factors Healthcare system factors	-Parental emotions: Parental anxiety. -Hours of operation, characteristics of the system: The unavailability of the primary care doctor at the required times and the performance of certain diagnostic tests.	CASPe: 7/10 (Strong) LOE: 3e GOR: B
Ravi et al. (2021) FRANCE Observational Study Descriptive Cross-sectional	<b>Sample:</b> 140 parents.	<b>Intervention:</b> Ad hoc survey.	Sociodemographic factors	-Educational attainment, age and nationality/ethnicity/parental race: Caregivers who identified as Black or African American (OR: 0.29; 95% CI: 0.11–0.74) and caregivers with lower educational attainment (OR: 0.32; 95% CI: 0.11–0.90) were less likely to have sought PC attention prior to seeking ED care ( $p < 0.005$ ).	STROBE:19/22 (Strong) LOE: 3e GOR: B GRADE: Low
Sojar et al. (2022) USA Observational Study Descriptive Cross-sectional	<b>Sample:</b> 71,360 medical records.	<b>Intervention:</b> Analysis of the National Survey of Children's Health.	Health status of the children seeking care	-Children with two or more unmet health needs had a 3.72 times (95% CI, 2.25–6.16) increased risk of $\geq 2$ ED visits compared to those with no unmet health needs.	STROBE:16/22 (Strong) LOE: 3e GOR: B GRADE: Very low
Shi et al. (2020) USA Observational Study Descriptive Cross-sectional	<b>Sample:</b> 268 parents/guardians.	<b>Intervention:</b> Ad hoc survey and review of MH.	Sociodemographic factors Health status of the children seeking care	-Patient age: Younger children (OR: 0.92; 95% CI: 0.86–0.97; $p < 0.01$ ). -Parental economic level: Family income less than \$20,000 (OR: 1.86; 95% CI: 1.02–3.39; $p < 0.01$ ).  -Pre-existing comorbidity (OR: 2.36; 95% CI: 1.26–4.42) and non-compliance with health supervision visits (OR: 5.83; 95% CI: 3.21–10.56; $p < 0.01$ ).	STROBE:18/22 (Strong) LOE: 3e GOR: B GRADE: Low

BSI-A: Brief Symptom Inventory—Anxiety; CASPe: Critical Appraisal Skills Programme Español; CI: Confidence Interval; CTQ- SF: Childhood Trauma Questionnaire—Short Form; Dom. Rep.: the Dominican Republic; ED: Emergency Department; EPDS: Edinburgh Postnatal Depression Scale; GRADE: Grading of Recommendations Assessment, Development and Evaluation; GOR: Grades Of Recommendation; LOE: Levels of Evidence; MFP: Mother-Father-Peer Scale; MH: Medical History; NHS: National Health Survey; OD: Odds Ratio; PC: Primary Care; PCL: Checklist-Civilian version; PED: Pediatric Emergency Department; PTSD: Post-Traumatic Stress Disorder; Quali.: Qualitative; Quanti.: Quantitative; STROBE: Strengthening the Reporting of Observational studies in Epidemiology.

2020; Perret et al., 2017) and three (15%) were systematic reviews (Alele et al., 2018; Butun & Hemingway, 2017; Butun et al., 2018).

Factors associated with the inappropriate use of PEDs

Sociodemographic factors

Sociodemographic factors were identified in twelve articles (60%). Two studies (10%) found that direct care-seeking in the emergency department was more common among parents of lower socioeconomic status (Ellbrant et al., 2018; Shi et al., 2020). Five studies (25%) found that low parental educational attainment influences the likelihood of attending the PED with minor ailments (Akbayram & Coskun, 2020; Alele et al., 2018; Kurt et al., 2020; Lockwood et al., 2019; Ravi et al., 2021). In contrast, Expósito-Ruiz et al. (2017) found that higher levels of parental educational attainment were directly positively associated with emergency department usage and Guyon-Harris et al. (2021) found no association. Only one study (5%) found that being foreign influences demand (Expósito-Ruiz et al., 2017). Two studies (10%) found a strong positive association with black caregivers (Alele et al., 2018; Ravi et al., 2021). Four studies (20%) (Alele et al., 2018; Expósito-Ruiz et al., 2017; Oliva & Oliva, 2017; Shi et al., 2020) reported that the younger age of children is a consistent factor in inappropriate use, with one finding that male gender is an associated factor (Expósito-Ruiz et al., 2017). The provision of childcare by non-regular caregivers is also a factor

influencing the demand for care (Barwise-Munro et al., 2018). Pehlivanurk-Kizilkan et al. (2022) found that parental employment status may play a role in the phenomenon under investigation.

Psychological factors

Thirteen studies (65%) provided insights into the psychological factors influencing the inappropriate use of the service. Parental perceived urgency was the most cited factor, accounting for 50% of the articles reviewed (Akbayram & Coskun, 2020; Barwise-Munro et al., 2018; Butun & Hemingway, 2017; Butun et al., 2018; Ellbrant et al., 2018; Kurt et al., 2020; Lockwood et al., 2019; McLauchlan et al., 2020; Pethe et al., 2019; Pehlivanurk-Kizilkan et al., 2022). Six studies (30%) reported parental emotions as having a role in non-urgent attendance, with the need for reassurance, concern for the child's health, frustration, fear, anxiety and the notion of responsibility being strong contributors (Barwise-Munro et al., 2018; Butun & Hemingway, 2017; Butun et al., 2018; Canévet et al., 2018; Guyon-Harris et al., 2021; Perret et al., 2017).

Parental role factors

First-time parenthood and the need for urgent parenting support influence non-emergency demand (Butun & Hemingway, 2017; Canévet et al., 2018). One study (5%) reported that low relational health (nurturing relationships, responsiveness and support throughout development), low perceived social support from family, low acceptance from

the mother's father figure in childhood and sexual abuse of the mother in childhood are elements related to demand (Guyon-Harris et al., 2021).

#### Health care system-related factors

Eleven articles (55%) provided information on healthcare system factors that may influence the phenomenon in question. The advantages of the emergency department (including hours of operation), satisfaction, the positive perception in PEDs and issues with PC (difficulties in getting an appointment, PC hours of operation and dissatisfaction with outpatient examinations and performance of certain diagnostic tests) were associated with non-urgent attendance (Alele et al., 2018; Akbayram & Coskun, 2020; Butun & Hemingway, 2017; Butun et al., 2018; Ellbrant et al., 2018; Kurt et al., 2020; McLauchlan et al., 2020; Oliva & Oliva, 2017; Ortega-Benítez et al., 2019; Perret et al., 2017; Pethe et al., 2019). The existence of a free public healthcare system and lack of medical coverage also proved to be a strong determinant (Alele et al., 2018; Butun et al., 2018).

#### Health status of the children seeking care factors

Pre-existing comorbidity and non-attendance at health supervision visits were associated with the phenomenon under investigation (Shi et al., 2020). Positive associations were also found with unmet health needs (Sojar et al., 2022).

#### Methodological quality of the selected studies

The three systematic reviews assessed with the AMSTAR-2 tool were of "moderate" quality. Twelve observational studies assessed using the STROBE scale were classified as "strong", with scores above 16 out of 22. The quality of evidence of the observational studies assessed using GRADE was "low" to "very low" for all articles. Studies with a qualitative design assessed with the CASPe scale were classified as "strong", with scores above 7 out of 10. In terms of the level of evidence, observational studies had the highest levels and systematic reviews the lowest. The grade of recommendation for all studies was weak.

## Discussion

This review provides a new and broad perspective, hitherto unexplored in previously published studies, by identifying factors related to sociodemographics, psychological aspects, the parental role, healthcare system and health status of the children seeking care that influence inappropriate use of PEDs. The authors are optimistic that this review provides useful insights for health researchers to solve this multifactorial problem whereby emergency services are overwhelmed due to increased demand, especially inappropriate demand (Martins et al., 2020; Watson & Blair, 2018).

There is mixed evidence on the sociodemographic factors associated with inappropriate demand. We would exercise caution when it comes to establishing a profile of people who bring their children to the emergency department. Several authors find that black caregivers (Alele et al., 2018; Ravi et al., 2021), low socioeconomic status (Ellbrant et al., 2018; Shi et al., 2020) and low parental educational level are predisposing factors (Akbayram & Coskun, 2020; Alele et al., 2018; Kurt et al., 2020; Lockwood et al., 2019; Ravi et al., 2021), results similar to those obtained in previous research (Wier et al., 2013). However, Guyon-Harris et al. (2021) find no such association, and Expósito-Ruiz et al. (2017) report that higher educational attainment is directly and positively associated with the phenomenon under investigation. The latter result may be due to the nature of the population analysed, as most had a higher level of education. The relationship between low parental educational attainment and low health literacy is well understood. Low parental health literacy is thought to be a contributing factor to increased use of PEDs, especially when the child's condition does not warrant urgent attention. According to Morrison et al.

(2013), parents with low levels of knowledge seek three times more assistance than those with adequate levels. There is evidence that this low health literacy is associated with parental anxiety and an inability to care for their children properly, hence the need to use the PED (May et al., 2018). In terms of the profile of the child requiring attention, it has been determined that younger children are a predisposing factor to increasing demand in PEDs, especially inappropriate demand (Expósito-Ruiz et al., 2017; Oliva & Oliva, 2017; Shi et al., 2020). Regarding sex, although the study by Alele et al. (2018) does not establish a profile, our review shows that male sex is related to PEDs visits (Expósito-Ruiz et al., 2017). Several explanations have been put forward for why male sex is a predisposing factor for attendance at these services. These include behavioral, social and cultural factors, risky practices in particular (Zachariasse et al., 2020).

The results of this study report that the provision of childcare by non-regular caregivers may influence the phenomenon of demand for care in PEDs (Barwise-Munro et al., 2018). Women's entry into the labour market has led to a paradigm shift in childcare (Cortés-Rodas et al., 2021), with families having to leave their children in the care of people other than their parents. Such caregivers may have a lower threshold for interpreting health-related warning signs in the children they care for and may feel the need to seek urgent medical attention when it is not really necessary (García et al., 2008).

The perceived need for urgent care remains one of the most cited factors, coinciding with the research carried out in adulthood (Alhussain et al., 2017; Weinreb et al., 2006). Parents are expected to properly manage their children's illnesses within the family; they should have enough information to discern whether a child's health issue is minor or serious, so that they can seek help when it is serious (May et al., 2018). It is unreasonable to expect parents to be equipped with the basic knowledge and experience necessary to properly assess the true nature and meaning of their children's symptoms. However, as suggested by several authors cited above, adequate health literacy would help to minimise this problem (May et al., 2018; Morrison et al., 2013), reducing the demand for care, the inappropriate use of and costs in emergency departments (Hummel et al., 2014; Unwin et al., 2016). As it stands, however, interventions in this field of interest, such as the provision of information and follow-up support, are still few and far between (Poku & Hemingway, 2019).

Parental emotions, in particular the need for reassurance, concern for the child's health, frustration, depression, fear, anxiety and the notion of parental responsibility are all cited in the literature as predisposing factors to the inappropriate use of PEDs (Akbayram & Coskun, 2020; Barwise-Munro et al., 2018; Butun & Hemingway, 2017; Butun et al., 2018; Guyon-Harris et al., 2021; Kurt et al., 2020; McLauchlan et al., 2020). It is therefore understood that parental psychological distress plays a vital part in the decision to use this service and as a consequence, increasing the frequency of demand. In fact, this has also been identified as one of the predisposing factors for emergency department use in adulthood (Alhussain et al., 2017; Weinreb et al., 2006).

The contributions of Guyon-Harris et al. (2021), provide a detailed analysis of how parenting can influence the problem under investigation. Poor relational health, low perceived social support from family, low acceptance by the mother's father figure in childhood and a history of childhood abuse of the mother were associated with higher utilization of child health care services. In terms of the evidence provided by these authors, only data from studies conducted in adulthood can be corroborated (Weinreb et al., 2006). This present review also now finds that the reason behind inappropriate PED use may mask an implicit demand for urgent parenting support (Canévet et al., 2018). We believe that those parents with low parental competence, i.e. the set of skills that enable parents to cope with the vital task of parenting, are more likely to make inappropriate visits to the PED due to management that is at odds with the performance of the effective parental role (Barudy & Dantagnan, 2010; Berryhill, 2016).

The characteristics of the system itself and satisfaction with services continue to be one of the most influential determinants (Akbarayam & Coskun, 2020; Alele et al., 2018; Butun & Hemingway, 2017; Butun et al., 2018; Ellbrant et al., 2018; Kurt et al., 2020; McLaughlan et al., 2020; Oliva & Oliva, 2017; Ortega-Benítez et al., 2019; Perret et al., 2017; Pethe et al., 2019). This is consistent with previous evidence suggesting that parents believe that their child's health problem will be resolved more quickly in the PED. Parents have more confidence in the expertise of hospital professionals and feel that there is a better diagnostic and treatment service (Unwin et al., 2016). It is therefore understood that problems accessing PC (difficulties in getting an appointment and PC hours of operation) and the advantages offered by the PED continue to be important factors leading to inappropriate usage and, therefore, increasing demand for care. The existence of a free public healthcare system or the nature of the insurance itself are also considered to be strong determinants of inappropriate PED use (Alele et al., 2018; Butun et al., 2018; Kurt et al., 2020). These results are similar to those studies carried out in adulthood (Uscher-Pines et al., 2013).

In terms of study limitations, we found that most of the articles included are descriptive cross-sectional observational studies, and that there may be some self-selection bias in the selection and compilation of information from the different databases. The data should be interpreted taking into account the multicultural and heterogeneous nature of the studies' countries of origin. While we are aware that the interpretation of the quality scales is certainly subjective, their results were discussed and agreed upon in regular meetings. In terms of future lines of research, we would encourage researchers to conduct studies exploring the exercise of the parental role, relational health and parenting performance as major factors in the inappropriate use of and demand for PED care. There is little evidence to date and more information on this issue would be valuable.

## Conclusion

The younger age of children, black caregivers, lower socioeconomic status, lower parental educational attainment, the demand for care perceived as urgent, parental emotions in response to their children's health problems, psychological distress, the ineffective exercise of the parental role, the advantages of the PED and the nature of health insurance are consistent factors concerning the inappropriate use of the emergency department. Gaining an understanding of these factors can contribute to the development of healthcare education programmes and interventions. Further research is needed on factors related to family functioning, relational health and parenting. Analysis of the data suggests that parental support in the area of basic childcare and parenting is needed in order to reduce the increasing demand, especially inappropriate demand for these healthcare services worldwide.

## Author contributions

All authors have agreed on the final version and meet at least one of the following criteria: (1) substantial contributions to conception and design, data acquisition or data analysis and interpretation and (2) drafting the article or revising it critically for important intellectual content.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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