

RESEARCH ARTICLE (ORIGINAL)

Analysis of The Use of An Emergency Department in A Hospital in Portugal: An Observational Study

Análise da Utilização de um Serviço de Urgência num Hospital em Portugal: Um Estudo Observacional

Análisis del Uso de un Servicio de Urgencias en un Hospital de Portugal: Un Estudio Observacional

Joana Sofia da Cruz Costa ¹

 <https://orcid.org/0009-0003-2944-510X>

Lígia Marina Gonçalves Baptista ¹

 <https://orcid.org/0009-0009-0496-3983>

Ana Catarina Martins de Sousa Carneiro ¹

 <https://orcid.org/0009-0005-9732-8380>

Carina Isabel Marques de Matos ¹

 <https://orcid.org/0009-0009-0627-5383>

Sandra Patrícia da Silva Vilas Boas ¹

 <https://orcid.org/0009-0001-1867-1959>

¹ Local Health Unit of Alto Minho, Critical Care Medicine Department, Emergency Service, Viana do Castelo, Portugal

Abstract

Background: Emergency departments (EDs) face overload due to excessive use for non-urgent conditions. The Manchester Triage System (MTS) is essential for prioritizing care according to symptom severity.

Objective: To analyze the patterns of ED use by patients at a hospital in northern Portugal.

Methodology: An observational study using data from clinical records in the “SClinico” information system, covering all ED admissions from January 1, 2019, to December 31, 2022.

Results: ED admissions decreased in 2020, but by 2022 admissions exceeded pre-pandemic levels. The most frequent reason for ED use among non-urgent patients was mild pain.

Conclusion: The high proportion of non-urgent visits reinforces the need to promote health literacy and strengthen primary healthcare services to reduce excessive ED use.

Keywords: emergency medical services; triage; medical overuse; health literacy; digital health; access to primary care

Resumo

Enquadramento: O serviço de urgência enfrenta sobrecarga devido ao uso excessivo para condições não urgentes, sendo o Sistema de Triagem de Prioridades de Manchester essencial para priorizar os atendimentos com base na gravidade clínica.

Objetivo: Analisar a utilização realizada pelos utentes do serviço de urgência de um hospital da região norte de Portugal.

Metodologia: Estudo observacional. Os dados foram obtidos com consulta dos registos clínicos no sistema de informação “SClinico” a todos os utentes admitidos no serviço de urgência, no período de 01 de janeiro de 2019 a 31 de dezembro de 2022.

Resultados: Em 2020, as admissões diminuíram (108.120), mas em 2022 superaram o período pré-pandemia (170.013). Cerca de 40% dos utentes foram não urgentes, principalmente por queixas de dor ligeira (55,3%).

Conclusão: A elevada proporção de casos não urgentes reforça a necessidade de promover literacia em saúde e fortalecer os cuidados de saúde primários para reduzir o uso excessivo do serviço de urgência.

Palavras-chave: serviços médicos de emergência; triagem; uso excessivo dos serviços de saúde; literacia em saúde; saúde digital; acesso à atenção primária

Resumen

Marco contextual: El servicio de urgencias se enfrenta a una sobrecarga debido al uso excesivo para afecciones no urgentes, por lo que el Sistema de Clasificación de Prioridades de Manchester es esencial para priorizar las atenciones en función de la gravedad clínica.

Objetivo: Analizar el uso que hacen los usuarios del servicio de urgencias de un hospital de la región norte de Portugal.

Metodología: Estudio observacional. Los datos se obtuvieron consultando los registros clínicos en el sistema de información “SClinico” a todos los usuarios admitidos en el servicio de urgencias, en el periodo comprendido entre el 1 de enero de 2019 y el 31 de diciembre de 2022.

Resultados: En 2020, las admisiones disminuyeron (108 120), pero en 2022 superaron el período prepandémico (170 013). Alrededor del 40 % de los usuarios fueron casos no urgentes, principalmente por dolores leves (55,3 %).

Conclusión: La elevada proporción de casos no urgentes refuerza la necesidad de promover la alfabetización sanitaria y fortalecer la atención primaria para reducir el uso excesivo del servicio de urgencias.

Palabras clave: servicios médicos de urgencia; triaje; uso excesivo de los servicios de salud; alfabetización en salud; salud digital; acceso a atención primaria

Corresponding author

Joana Sofia da Cruz Costa

E-mail: joana.costa@ulsam.min-saude.pt

Received: 17.03.25

Accepted: 19.10.25



Escola Superior de
Enfermagem de Coimbra

fct

Fundação
para a Ciência
e a Tecnologia

How to cite this article: Costa, J. S., Baptista, L. M., Carneiro, A. C., Matos, C. I., & Vilas Boas, S. P. (2025). Analysis of The Use of An Emergency Department in A Hospital in Portugal: An Observational Study. *Revista de Enfermagem Referência*, 6(4), e40250. <https://doi.org/10.12707/RV125.30.40250>



Introduction

Emergency departments (EDs) are essential for the immediate treatment of critical health conditions; however, they face persistent challenges, including overcrowding and limited health literacy, which compromise patient flow management in Portuguese hospitals (Brazão & Baptista, 2022; Dixe et al., 2018; Silva et al., 2025). The high demand for EDs, often driven by non-urgent cases, undermines their core mission to provide timely care for severe situations, resulting in overcrowding, prolonged waiting times, increased costs, and user dissatisfaction (Brazão & Baptista, 2022; Dixe et al., 2018; Savioli et al., 2022; Vainieri et al., 2020).

According to the World Health Organization (WHO, 2021) and the Organization for Economic Cooperation and Development (OECD, 2023), Portugal recorded an ED utilization rate of approximately 300 visits per 1,000 inhabitants in 2021—higher than the European average of 250 visits per 1,000 inhabitants. This reality mirrors patterns observed in developed countries, where up to 30% of ED visits are classified as non-urgent (WHO, 2021). In contrast, health systems with stronger primary health care (PHC) integration, such as Sweden, report non-urgent ED use rates below 20%, largely due to pre-hospital triage strategies (Kessel et al., 2022).

The Manchester Triage System (MTS), implemented in Portugal since 2000, is a clinical and organizational tool designed to classify patients according to symptom severity, ensuring that the most urgent cases receive priority care (Andika et al., 2025; Brazão & Baptista, 2022). Clinically, the MTS supports decision-making through validated protocols that guide the assessment of signs and symptoms (Mackway-Jones et al., 2023; Grupo Português de Triagem [GPT], 2021). Organizationally, it contributes to optimizing patient flow and resource allocation in EDs (Andika et al., 2025; Savioli et al., 2022; Vainieri et al., 2020). In Portugal, triage is performed by nurses who draw upon both technical skills, such as clinical assessment, and human skills, such as empathic communication, to ensure a holistic approach to care—skills recognized by the International Council of Nurses (ICN) as fundamental to ED management (ICN, 2022; Brazão & Baptista, 2022). The analysis period of 2019 to 2022 was selected because it encompasses the pre-pandemic, pandemic, and post-pandemic phases of COVID-19, a period during which pressure on EDs intensified, with Portugal experiencing a 15% increase in visits in 2020 (Instituto Nacional de Estatística, 2021). This timeframe allows for an assessment of the MTS under exceptional conditions. ED overcrowding produces significant consequences, including delayed care—averaging 3 hours in 2022 (Instituto Nacional de Estatística, 2021)—increased operational costs, estimated at €500 million annually for the Portuguese Health Service (SNS; Brazão & Baptista, 2022), and heightened risks to care quality, such as a greater likelihood of clinical error (Savioli et al., 2022). National studies highlight that improving public education on appropriate ED use and reinforcing PHC integration could reduce non-urgent demand by up to 25% (Dixe et al., 2018).

The overall aim of this study is to analyze ED use among patients admitted to a hospital in northern Portugal. To achieve this, two specific objectives were defined: (a) to quantify the frequency of ED admissions according to triage priority levels from 2019 to 2022, and (b) to identify the main reasons for ED use during the same period.

Background

EDs are multidisciplinary hospital structures composed of healthcare professionals from various fields (physicians, nurses, technicians, among others), designed to provide healthcare to patients in urgent and/or emergency situations (Coster et al., 2017; Savioli et al., 2022). An urgent situation refers to a clinical condition requiring rapid medical intervention to prevent complications, although it does not pose an immediate risk to life. In contrast, an emergency implies a situation involving imminent risk of death or loss of function, requiring immediate intervention (Coster et al., 2017; Mackway-Jones et al., 2023; Savioli et al., 2022).

Globally, EDs face high demand, often for non-urgent cases, which compromises the quality, safety, and efficiency of care (Dixe et al., 2018; WHO, 2021). This excessive demand produces social impacts, such as patient dissatisfaction; organizational consequences, such as overcrowding and delayed care; economic burdens, such as high costs; professional consequences, such as burnout among multidisciplinary teams; and care safety risks, such as higher probability of clinical error (Barbosa et al., 2024; Brazão & Baptista, 2022; Instituto Nacional de Estatística, 2021; Savioli et al., 2022).

Excessive use of EDs is defined as seeking these services for clinical conditions that could be adequately managed in PHC settings or other less complex structures (Coster et al., 2017; Dickinson & Joos, 2021; Dixe et al., 2018). International studies identify factors that increase demand, such as: (1) limited access to PHC, especially at night or on weekends; (2) low health literacy, leading patients to misinterpret non-urgent symptoms as emergencies; and (3) the convenience of EDs, with 24-hour service without the need for an appointment (Dixe et al., 2018). Conversely, factors that reduce ED demand include improved access to PHC, health education initiatives, and pre-hospital triage systems (Dixe et al., 2018).

The MTS defines triage-based admission as the process of classifying patients according to symptom severity, using standardized flowcharts that determine target times for the first medical observation (GPT, 2021; Mackway-Jones et al., 2023).

The MTS categorizes patients into five priority levels with corresponding colors and maximum waiting times: (1) Immediate (red): 0 minutes; (2) Very urgent (orange): 10 minutes; (3) Urgent (yellow): 60 minutes; (4) Standard (green): 120 minutes; and (5) Non-urgent (blue): 240 minutes (GPT, 2021; Mackway-Jones et al., 2023). This system requires clinical reasoning, pattern recognition, and intuitive judgment, with nurses, due to their holistic approach to care, holding primary respon-

sibility for conducting triage in Portugal (ICN, 2022). The main functions of the MTS include: (1) identifying life-threatening conditions; (2) prioritizing care based on severity; (3) reassessing patients while they await care; (4) directing patients to appropriate observation areas; (5) informing patients and families about the process; and (6) optimizing flow to reduce ED congestion (GPT, 2021; Mackway-Jones et al., 2023). However, excessive use of EDs persists due to perceived accessibility (24-hour service with no need for an appointment) and limited PHC integration (Dixe et al., 2018; Pinchbeck, 2019). The consequences include prolonged waiting times, reduced patient satisfaction, and professional overload, with 40% of nurses reporting burnout (Andika et al., 2025; Dixe et al., 2018; Silva et al., 2025; Instituto Nacional de Estatística, 2021). To mitigate the problem, studies recommend strengthening PHC services, implementing digital health literacy initiatives, and standardizing information available in healthcare facilities (Coster et al., 2017; Dickinson & Joos, 2021; Silva et al., 2025). This study aims to analyze the reasons underlying excessive ED use in the hospital under study, evaluating the role of the MTS in managing demand and proposing strategies to improve access and quality of care based on national and international evidence.

Research question

What is the frequency of admissions to the ED according to the MTS priority levels?

Subquestion 1.1: How are admissions distributed across the five priority levels (immediate, very urgent, urgent, standard, non-urgent) between 2019 and 2022? **Subquestion 1.2:** What proportion of admissions classified as non-urgent (green and blue) corresponds to the total number of ED visits?

What are the reasons that lead patients to seek care in the ED?

Subquestion 2.1: What are the main clinical reasons for ED use, as identified in the flowcharts reported by patients?

Methodology

Study design

This study uses an observational design, as no intervention or manipulation of variables was performed. Instead, the analysis is based on existing data recorded in the *SCLínico Hospitalar – Urgência e Triage* (Hospital SCLínico – Emergency and Triage) information system between 2019 and 2022, which is appropriate for examining use patterns in natural contexts, such as EDs (Polit & Beck, 2021; von Elm et al., 2007).

Context and Population

The study was conducted in the ED of a hospital located in northern Portugal, serving a district covering 2,213 km² with a population of 231,266 inhabitants, of whom

11.7% are under 15 years of age and 28.1% are 65 years or older (Instituto Nacional de Estatística, 2021). The study population consisted of all ED episodes recorded during the study period, with no age or sex restrictions. The years 2019–2022 were selected to capture variations in demand, including the impact of the COVID-19 pandemic.

Data collection

Data were extracted from the *SCLínico Hospitalar – Urgência e Triage* (Hospital SCLínico – Emergency and Triage) information system, which records all ED episodes and corresponding MTS classifications. Extraction was performed by a research team composed of five health professionals from the ED under study between January and March 2023 and included all episodes documented in 2019, 2020, 2021, and 2022. The following variables were collected for each episode: date of admission, triage priority level (according to MTS: red, orange, yellow, green, or blue), and main MTS discriminator (reason for admission). Data were retrieved through structured system queries, ensuring data anonymity and adherence to ethical standards.

Absolute and relative frequencies of ED episodes were calculated by triage priority for each year (2019–2022). Patients classified with green or blue bracelets were considered non-urgent, consistent with standard MTS criteria (GPT, 2021). A low-urgency or non-urgent patient presents a clinical condition without immediate risk to life or severe impairment of vital functions, and is often suitable for management in PHC, basic emergency units, or via tele-triage, without requiring hospital-based ED care (Dixe et al., 2018). Reasons for admission were identified based on MTS discriminators and categorized into mutually exclusive groups, such as “mild pain,” “recent problem,” “orthopedic problems,” “respiratory problems,” among others, according to the MTS flowcharts. Each episode was associated with one primary discriminator.

Data analysis

The descriptive analysis included the calculation of absolute and relative frequencies to characterize the distribution of ED admissions by triage priority level and year, allowing for temporal comparisons. Reasons for admission were analyzed descriptively by category, with particular attention to non-urgent and standard cases. To assess associations between triage priority levels and years (2019–2022), as well as between reasons for admission and years, the chi-square test of independence was applied. Before applying the test, assumptions were verified, including adequate sample size and ensuring that no more than 20% of cells in the contingency table had expected frequencies below 5, as recommended by Field (2018). A significance level of $p < .05$ was adopted to identify statistically significant associations.

Ethical considerations

Data confidentiality was ensured through the following procedures: (1) anonymity of records; (2) restricted data access limited to authorized researchers; and (3) secure encrypted storage on protected servers, in accordance with the General Data Protection Regulation (GDPR;

European Union, 2025). The study obtained authorization from the President of the Board of Directors of the hospital and a favorable opinion from the hospital's Health Ethics Committee (Opinion No. 25/2023), ensuring compliance with the ethical standards for health research (World Medical Association, 2024).

Validity and Reliability

The use of the *SCLínico* information system enhances data reliability, as it is a standardized tool implemented across the SNS. The categorization of reasons for admission followed validated MTS protocols, and cross-validation procedures helped minimize classification errors. Inferential analysis increased the robustness of temporal comparisons for observational studies (von Elm et al., 2007).

Results

The following results refer to the analysis of ED episodes recorded in a hospital in northern Portugal between 2019 and 2022, focusing on the frequency of admissions according to MTS triage priority levels and the reasons why non-urgent patients (green bracelet – standard; blue bracelet – non-urgent) sought care in the ED.

Frequency of admissions by triage priority between 2019 and 2022

Figure 1 presents the absolute and relative frequencies of ED episodes per year, displayed graphically to facilitate interpretation.

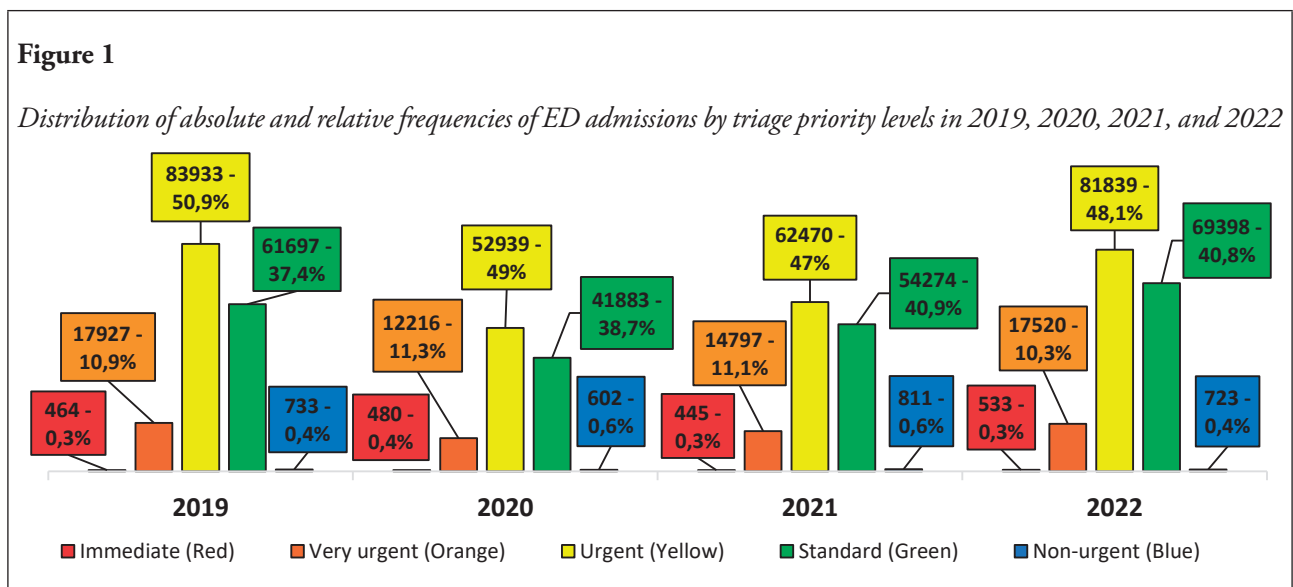


Figure 1 shows that in 2019 there were 164,754 ED episodes, of which 37.8% (62,277) were classified as non-urgent (green and blue bracelets). In 2020, the number of episodes decreased to 108,120, with 39.3% (42,491) classified as non-urgent. In 2021, 132,797 episodes were recorded, and 41.5% (55,111) were non-urgent. In 2022, there were a total of 170,013 episodes, with 41.2% (70,045) being non-urgent.

The chi-square test indicated a statistically significant association between year and the proportion of non-urgent admissions ($\chi^2 = 245.3$, $p < .001$). The proportion of non-urgent cases was significantly higher in 2021 and 2022 compared to 2019 and 2020, a pattern that may be related to changes caused by the COVID-19 pandemic (WHO, 2021).

Reasons for Admission among Non-Urgent Patients (green and blue bracelets)

The reasons for admission among non-urgent patients (green and blue bracelets) were categorized according to MTS criteria. The category “recent problem” refers to sudden-onset complaints of up to 7 days’ duration that do not meet criteria for other specific flowchart categories and do not indicate immediate severity (GPT, 2021; Mackway-Jones et al., 2023).

Table 1 presents the aggregate relative frequencies of reasons for admission among non-urgent patients (green and blue bracelets) from 2019 to 2022, allowing for the examination of changes over time.

Table 1

Distribution of aggregate relative frequencies of reasons for admission among non-urgent patients between 2019 and 2022

Reason for admission	2019	2020	2021	2022	Mean (between 2019 and 2022)
Mild pain	55%	55%	55%	56%	55.3%
Recent problem	10%	12%	13%	10%	11.3%
Wounds / Inflammatory signs / Foreign body	12%	10%	13%	11%	11.5%
Orthopedic problems / Minor trauma	9%	9%	6%	8%	8%
Urinary problems	4%	4%	4%	4%	4%
Mild respiratory problems	3%	4%	4%	4%	3.8%
Eye problems	3%	3%	2%	2%	2.5%
Vomiting	3%	2%	3%	3%	2.8%
Other pathologies	1%	1%	1%	1%	1%
Non-disruptive behavior	0.8%	0.9%	0.8%	0.8%	0.8%
Neurological problems	0.2%	0.1%	0.2%	0.2%	0.2%
Gynecological problems	~0%	~0%	~0%	~0%	~0%

Note. ~0% = values below 0.1%.

Table 1 indicates that “mild pain” was the most frequent reason for ED visits across all years (mean = 55.3%), followed by “wounds/inflammatory signs/foreign bodies” (mean = 11.5%) and “recent problem” (mean = 11.3%). Based on these findings, the following section will analyze and discuss the main results to better understand what leads patients to seek care in the ED and the implications of excessive ED use.

Discussion

The high demand for ED services for non-urgent conditions reflects a global challenge in health system management (Dixe et al., 2018). Between 2019 and 2022, approximately 40% of admissions to the ED under study were classified as non-urgent (green and blue bracelets) according to the MTS.

“Mild pain” was the primary complaint leading patients to seek care in the ED (mean = 55.3%). This finding aligns with previous research identifying pain as the main reason for excessive ED demand, due to its subjective perception as an emergency (Barbosa et al., 2024; Mackway-Jones et al., 2023). Other reasons, including “wounds/inflammatory signs/foreign body” (mean = 11.5%) and “recent problem” (mean = 11.3%), suggest conditions that could be managed in PHC settings. These patterns indicate gaps in knowledge about alternative SNS options or barriers to access PHC (Dickinson & Joos, 2021; Silva et al., 2025). The consistency of these patterns between 2019 and 2022 indicates that excessive ED use is a structural challenge in the SNS, rather than solely a contextual effect of the pandemic, but also associated with low health literacy, limited PHC access, and the convenience of EDs (24-hour service without the need for an appointment; Dixe et al., 2018; Silva et al., 2025).

The temporal analysis revealed a reduction in total admissions in 2020 (108,120 episodes) compared to 2019 (164,754), followed by a recovery in 2021 (132,797) and exceeding pre-pandemic levels in 2022 (170,013). The chi-square test of independence demonstrated significant associations between triage priority levels and years ($\chi^2 = 245.3$; $p < .001$), with an increase in non-urgent admissions from 37.8% in 2019 to 41.5% in 2021. This pattern may be related to the suspension of PHC consultations during the COVID-19 pandemic, leading patients to seek care in EDs for conditions manageable at other levels of care (Barbosa et al., 2024). Although urgent cases (yellow wristband) remained predominant (47%–51%), the growth of non-urgent cases in 2021 and 2022 highlights the need for strategies for patient redirection.

Excessive use of EDs, defined as seeking care for conditions that can be managed in PHC settings or through digital triage (Silva et al., 2025), has negative consequences, such as prolonged waiting times (mean = 3 hours, Instituto Nacional de Estatística, 2021), patient dissatisfaction, professional burnout, increased costs, and higher risk of clinical error (Brazão & Baptista, 2022). Strategies to mitigate these effects include strengthening health literacy, improving access to PHC, and implementing information offices in healthcare facilities to redirect patients to appropriate services, thereby reducing the burden on EDs (Kessel et al., 2022; Shahid et al., 2022). Initiatives such as the SNS 24 hotline and the “Call First, Save Lives” project (Portaria n.º 71/2024, 2024) reduced non-urgent ED visits by 15% by directing patients to appropriate services (Silva et al., 2025). Similarly, digital health interventions, such as educational apps on symptoms and awareness campaigns in Canada and Sweden, respectively, have reduced non-urgent care by 15% to 20% (Kessel et al., 2022; Shahid et al., 2022), reduzindo a saturação e melhorando a qualidade e segurança dos cuidados. Motivos

de Admissão para Utentes Não Urgentes.

Improving PHC access, such as extending opening hours and ensuring the availability of general and family medicine consultations, reduces dependence on EDs (Dickinson & Joos, 2021; Dixe et al., 2018). While strategies such as patient fees may be effective in some contexts, they must be carefully implemented to avoid restricting access for vulnerable populations (Dixe et al., 2018).

The results of this study suggest that the COVID-19 pandemic exposed weaknesses in PHC access but also highlighted the potential for SNS reform. The consistency of non-urgent admission reasons underscores the need for structural policies, including integration between ED and PHC, improved health literacy, and digital platforms, such as the SNS 24 hotline, to reduce excessive ED use. The study has some limitations. First, it was conducted in a single hospital in northern Portugal, which limits the generalization of the findings to other contexts within the SNS. Second, the absence of qualitative data on patients' subjective motivations prevents the understanding of sociodemographic or behavioral factors associated with inappropriate demand. Future research should address these gaps and assess the impact of digital interventions, such as health apps, in Portuguese settings, and conduct longitudinal studies with larger samples to assess the effectiveness of health literacy campaigns and SNS integration.

Conclusion

This study analyzed the frequency and reasons for ED admissions in Portugal between 2019 and 2022, according to the MTS. The results indicate that approximately 40% of ED admissions are classified as non-urgent, primarily due to mild pain, reflecting excessive ED use. For patients, this overuse means prolonged waiting times and lower quality of care. For professionals, it contributes to overload and burnout.

The practical implications point to the need to strengthen health literacy through digital technologies, such as the SNS 24 hotline, educational apps, and telemedicine platforms, while promoting better coordination between EDs and PHC. Expanding access to general and family medicine consultations and implementing public awareness campaigns on the appropriate use of health services are essential to redirect non-urgent cases to PHC services, reserving EDs for urgent and emergency cases that cannot be managed at other levels of care, thus optimizing the efficiency, safety, and sustainability of the SNS.

The implementation of public policies that facilitate prior triage and appropriate referral, such as online appointment systems and increased availability of PHC professionals, can help alleviate pressure on EDs. When combined with a long-term strategic vision, these interventions are fundamental for promoting a resilient, accessible, and patient-centered SNS.

Author contributions

Conceptualization: Costa, J. S., Baptista, L. M.

Data curation: Costa, J. S., Baptista, L. M.

Formal analysis: Costa, J. S., Baptista, L. M.,

Funding acquisition: Costa, J. S., Baptista, L. M.

Investigation: Costa, J. S., Baptista, L. M.

Methodology: Costa, J. S., Baptista, L. M.

Project administration: Costa, J. S., Baptista, L. M.

Resources: Costa, J. S., Baptista, L. M.

Software: Costa, J. S., Baptista, L. M.

Supervision: Costa, J. S., Baptista, L. M.

Validation: Costa, J. S., Baptista, L. M., Carneiro, A. C., Matos, C. I., Vilas Boas, S. P.

Visualization: Costa, J. S., Baptista, L. M., Carneiro, A. C., Matos, C. I., Vilas Boas, S. P.

Writing – original draft: Costa, J. S., Baptista, L. M.

Writing – review & editing: Costa, J. S., Baptista, L. M., Carneiro, A. C., Matos, C. I., Vilas Boas, S. P.

References

- Andika, P. J., Safaruddin, Christina, T. Y., Baso, Y. S., & Utami, S. (2025). Effectiveness of the Manchester triage system in the emergency department: A literature review. *BIO Web of Conferences*, 152, 01004. <https://doi.org/10.1051/bioconf/202515201004>
- Barbosa, J., Organista, D., Rodrigues, T., Matos, A. F., Barardo, A., Escoval, A., Bárbara, C. & Rodrigues, F. (2024). Profile of emergency department overuse in hospitalized patients with pulmonary disease and its impact on mortality. *Pulmonology*, 30(6), 586-594. <https://doi.org/10.1016/j.pulmoe.2023.01.005>
- Brazão, M. L., & Baptista, A. M. (2022). Queremos mesmo melhorar as urgências em Portugal? *Lusiadas Scientific Journal*, 3(3), 7-11. <https://doi.org/10.48687/ljsj.130>
- Coster, J. E., Turner, J. K., Bradbury, D., & Cantrell, A. (2017). Why do people choose emergency and urgent care services? A rapid review utilizing a systematic literature search and narrative synthesis. *Academic Emergency Medicine*, 24(9), 1137-1149. <https://doi.org/10.1111/acem.13220>
- Dickinson, A., & Joos, S. (2021). Barriers to integration of primary care into emergency care: Experiences in Germany. *International Journal of Integrated Care*, 21(2), 11. <https://doi.org/10.5334/ijic.5442>
- Dixe, M. A., Passadouro, R., Peralta, T., Ferreira, C., Lourenço, G., & Sousa, P. M. (2018). Determinantes do acesso ao serviço de urgência por utentes não urgentes. *Revista de Enfermagem Referência*, 4(16), 41-52. <https://doi.org/10.12707/RIV17095>
- European Union. (2025). *Complete guide to GDPR compliance*. <https://gdpr.eu/>
- Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). Sage edge.
- Grupo Português de Triage. (2021). *Sistema de Triage de Manchester*. <https://www.grupoportuguesetriagem.pt/grupo-portugues-triagem/protocolo-triagem-manchester/>
- Instituto Nacional de Estatística. (2022). *Estatísticas de saúde 2020*. https://www.ine.pt/xportal/xmain?xpid=INE&xpgid=ine_publicacoes&PUBLICACOESpub_boui=436989156&PUBLICACOESmodo=2
- International Council of Nurses. (2022). *Nurses: A Voice to Lead Invest in nursing and respect rights to secure global health*. https://www.icn.ch/sites/default/files/2023-04/ICN_IND_Toolkit_English_FINAL.pdf
- Kessel, R. V., Wong, B. L., Clemens, T., & Brand., H. (2022). Digital health literacy as a super determinant of health: More than simply

- the sum of its parts. *Internet Interventions*, 27, 100500. <https://doi.org/10.1016/j.invent.2022.100500>
- Mackway-Jones, K., Marsden, J., & Windle, J. (2023). *Emergency triage: Manchester triage group* (3rd ed.). Wiley Blackwell.
- Organization for Economic Co-operation and Development. (2023). *Health at a glance 2023: OECD indicators*. https://www.oecd.org/content/dam/oecd/en/publications/reports/2023/11/health-at-a-glance-2023_e04f8239/7a7afb35-en.pdf
- Pinchbeck, E. W. (2019). Convenient primary care and emergency hospital utilisation. *Journal of Health Economics*, 68, 102242. <https://doi.org/10.1016/j.jhealeco.2019.102242>
- Polit, D. F., & Beck, C. T. (2021). *Nursing research: Generating and assessing evidence for nursing practice* (11th ed.). Wolters Kluwer.
- Portaria nº 71/2024 da Saúde. (2024). *Diário da República: 1.ª Série*, n.º 41. <https://diariodarepublica.pt/dr/detalhe/portaria/71-2024-853780170>
- Savioli, G., Ceresa, I. F., Gri, N., Piccini, G. B., Longhitano, Y., Zanza, C., Piccioni, A., Esposito, C., Ricevuti, G., & Bressan, M. A. (2022). Emergency department overcrowding: Understanding the factors to find corresponding solutions. *Journal of Personalized Medicine*, 12(2), 279. <https://doi.org/10.3390/jpm12020279>
- Shahid, R., Shoker, M., Chu, L. M., Frehlick, R., Ward, H., & Pahwa, P. (2022). Impact of low health literacy on patients' health outcomes: A multicenter cohort study. *BMC Health Services Research*, 22, 1148. <https://doi.org/10.1186/s12913-022-08527-9>
- Silva, F. G., Costa, S., Malcata, F., Sá, J., Vasconcelos, R., Cabral, M., Guedes, R., Vilaça, I. M., Guedes, L. P., Ferreira, J., Pereira, N., Pais, J. G., Neves, J., Monteiro, J., Pires, V., Paiva, M., Guimarães, R., Ashrafian, H., Moreira, R., ... Araújo, F. (2025). Addressing the overuse of hospital emergency departments in the Portuguese NHS: A new paradigm. *Frontiers in Public Health*, 12, 1444951. <https://doi.org/10.3389/fpubh.2024.1444951>
- Vainieri, M., Panero, C., & Coletta, L. (2020). Waiting times in emergency departments: A resource allocation or an efficiency issue? *BMC Health Services Research*, 20, 549. <https://doi.org/10.1186/s12913-020-05417-w>
- von Elm, E., Altman, D. G., Egger, M., Pocock, S. J., Gøtzsche, P. C., & Vandenbroucke, J. P. (2007). Strengthening the reporting of observational studies in epidemiology (STROBE) statement: Guidelines for reporting observational studies. *BMJ*, 335, 806-808. <https://doi.org/10.1136/bmj.39335.541782.AD>
- World Health Organization. (2021). *Global patient safety action plan 2021-2030: Towards eliminating avoidable harm in health care*. <https://iris.who.int/server/api/core/bitstreams/a28c34c0-089c-4f5d-a0b1-5d9c35a3cd67/content>
- World Medical Association. (2024). *WMA Declaration of Helsinki – Ethical Principles for Medical Research Involving Human Participants*. <https://www.wma.net/policies-post/wma-declaration-of-helsinki/>