

ORIGINAL ARTICLE

Nurses' decision-making in the Manchester Triage System: influencing factors and improvement strategies*

HIGHLIGHTS

1. Decision-making combines clinical reasoning and experiential knowledge.
2. Contextual pressures can distort triage accuracy and prioritisation.
3. Targeted training can optimise emergency triage decision processes.
4. Structured support tools may strengthen decision-making consistency.

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Objective: To explore nurses' perceptions of decision-making in the Manchester Triage System, including implications for patient safety and improvement strategies.

Method: A qualitative and exploratory study was conducted in an emergency department in northern Portugal. Convenience sampling included ten nurses with over two years of triage experience. Semi-structured interviews were performed in May 2025 and analysed using Bardin's content analysis. **Results:** Triage was perceived as an essential contributor to patient safety by prioritising complaints and defining appropriate waiting times. Decision-making was influenced by nurse-related factors, patient-related factors, triage system limitations, and organisational context. Suggested improvements included audits, protocol revision, structured pain assessment, integration of early warning scores, ongoing training/recertification, mentorship, better information system interoperability, and institutional measures to reduce interruptions. **Conclusion:** Triage decision-making is multifactorial and requires continuous professional development and organizational support.

DESCRIPTORS: Triage; Nurses; Emergency Service, Hospital; Professional Training; Patient Safety.

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INTRODUCTION

The increase in emergency department admissions and the shortage of human and financial resources are currently among the challenges faced by health systems¹. Worldwide, in response to this problem, several triage systems have been developed and implemented, with the Manchester Triage System (MTS) being the one used in Portugal²⁻³. The MTS uses flowcharts and discriminators to classify individuals based on their clinical severity and to establish ideal observation times⁴.

Triage, however, occurs in a vulnerable, dynamic, and error-prone environment due to the exigency of fast and effective decisions⁵. Several factors, such as the nurse's experience, the patients' symptoms and clinical history, waiting times, and the overcrowding of the emergency department, have been described as determinant factors of the decision-making process⁶⁻⁷.

Triage, as a nursing responsibility, requires a critical judgment based on the nurse's experience and knowledge. However, due to its complexity and subjective nature, triage is subject to biases that must be identified and explored to develop quality improvement projects focused on patient safety⁷.

In this context, it was deemed necessary to explore nurses' perceptions of decision-making in the Manchester Triage System, including implications for patient safety and improvement strategies.

METHOD

The conducted study has a qualitative, exploratory, and descriptive character. The qualitative approach was chosen because it allows a profound understanding of how individuals perceive and experience the surrounding phenomena, thereby exploring the behaviours, perspectives, and experiences of the participants involved⁸.

The research was carried out in a local health unit [ULS] in the north of Portugal, responsible for primary and hospital care, more specifically in an emergency department with an average of 286 emergency episodes per day⁹.

The Manchester Triage System is the one used in this department. This emergency department was chosen for reasons of convenience, as the principal investigator was undertaking a nursing internship there. Although the researcher had previously undertaken a clinical placement at the study site, this did not constitute familiarity in the sense of a close or personal relationship. Interactions were consistently characterised by professional cordiality and mutual respect, and this did not affect the conduct of the interviews.

Participation was voluntary and began only after obtaining informed, free, and explicit consent, in accordance with the Declaration of Helsinki¹⁰.

Anonymity and confidentiality of both information and participants were ensured throughout all stages of the study by coding the interviews using random pseudonymisation, with a reversal key under the researchers' control. Initially, a random four-letter code was assigned. However, to simplify the presentation of the results, these codes were later converted into simpler identifiers (P1, P2, P3, P4...) as it was easier to read and understand the data. It is important to note that this sequential order does not match the chronological order in which the interviews were conducted, which were used solely for data presentation purposes.

The audio recordings captured during the interviews were deleted after transcription. The collected data was only used for the purposes defined.

The sampling method was non-probabilistic and convenience-based, with participants being personally invited by the researchers. The invited nurses agreed to participate in the study and signed the informed consent before participating.

The study included nurses who met the following criteria: those with more than two years of experience and MTS performance. General Nurses and Specialist Nurses were selected to obtain a wider sample.

Although the selection was carried out using a non-probabilistic method, it is worth highlighting three central concepts in its definition: representativity and heterogeneity, which ensure a diverse sample of the population; and data saturation, the point at which no new information is added to the research⁸.

Data collection was conducted through semi-structured interviews. These interviews enabled participants to share their experiences on the topic while allowing them the freedom to elaborate in directions they found relevant⁸.

The interviews were carried out in May 2025 by the main investigator, using a guide based on theoretical and empirical knowledge of nurses' decision-making in MTS. Two pre-test interviews were conducted to pilot-test and refine the interview guide. The individuals who participated in these pre-tests were not included in the study sample. With an average time of 15 minutes, the interviews were conducted in a calm, adequate environment, allowing for the protection of participants' privacy and the avoidance of interruptions. They were recorded by an audio recorder and were later transcribed by the principal investigator using the Transkriptor© application.

The treatment and analysis of the data obtained were carried out after the completion of the interviews, using a content analysis based on Bardin's assumptions¹¹. The software Atlas.ti© was used to facilitate analysis and data treatment.

In the pre-analysis (first phase), a floating reading of the content and a selection of the corpus were carried out to systematise and operationalise the initial ideas. In the material exploration (second phase), the data were coded, classified, and aggregated. Finally, in the interpretation and treatment of the results (third phase), the data were analysed to ensure that the findings were meaningful and valid¹¹.

The categorisation criteria used were semantic, and the data were categorised by searching for and respecting the criteria defined by Bardin¹¹. These included mutual exclusivity, ensuring that a recording unit cannot be included in more than one category; homogeneity, guaranteed by the use of a single classification principle; relevance, demonstrated by the alignment between the categories and the study's objectives; objectivity and reliability, ensuring the same categorisation framework is maintained after different analyses; and productivity, verified when the category system becomes a fertile ground for drawing inferences¹¹. The data analysis and categorisation were carried out by three investigators to ensure these criteria were met.

Based on the theoretical knowledge and the study's objective, pre-established categories were defined. However, due to the exploratory method adopted, new categories emerged.

In an ethical domain, ethical approval (opinion: 20/2025 - CAF) was obtained from the ethics committee of the ULS, where the research was conducted.

RESULTS

Characterization of Participants

The study included a total of 10 nurses. As detailed in Table 1, the sample comprised seven male nurses (70%), with a mean age of 41.8 years (SD = 4.49); high clinical maturity, presenting an average of 19.7 years of professional experience (SD = 4.73), of which 16.4 years (SD = 7.1) correspond to specific experience in the emergency department.

Table 1. Sociodemographic and professional characterisation of the participants (n=10). Guimarães, Portugal, 2025

Variable	n (%) / Mean (SD)
Gender	
Male	7 (70%)
Female	3 (30%)
Academic Qualifications	
Bachelor's Degree	7 (70%)
Master's Degree	3 (30%)
Professional Title	
General Care Nurse	6 (60%)
Specialist Nurse (Critical Care)*	4 (40%)
Postgraduate Training	
Management / Supervision / Trauma	7 (70%)
None reported	3 (30%)
Age (years)	41.8 (± 4.49)
Professional Experience (years)	19.7 (± 4.73)
Emergency Department Experience (years)	16.4 (± 7.1)

Legend: SD - Standard Deviation. * - Includes Medical-Surgical Nursing Specialisation.

Source: The authors (2025).

Regarding qualifications, three (30%) of participants hold a Master's degree and four (40%) hold the title of Specialist Nurse, predominantly in critical care. Additionally, seven (70%) possess postgraduate training in areas such as Health Unit Management, Clinical Supervision, or Trauma.

Content Analysis

The content analysis allowed for the identification of three central thematic dimensions regarding decision-making in triage: (1) Triage Contribution; (2) Factors Influencing Decision-Making; and (3) Strategies for Management and Quality Improvement. An overview of the thematic structure and emerging categories is presented in Chart 1.

Chart 1. Summary of thematic categories and subcategories regarding nurses' decision-making in triage. Guimarães, Portugal, 2025

Themes	Categories	Subcategories
1. Triage Contribution	Patient Safety	• Definition of clinical priorities • Allocation of appropriate waiting times
2. Factors Influencing Decision-Making	Human Capital	• Professional experience • Training and qualifications
	Clinical Challenges and System Limitations	• Patient medical history (integration) • Triage System Limitations (Pain subjectivity, Diabetes flowchart gaps) • Absence of discriminators (e.g. diaphoresis)
	Organisational Context	• Patient flow and overcrowding • Waiting times pressure • Infrastructure conditions
3. Strategies for Management and Quality Improvement	Quality & Governance	• Regular auditing • Procedural review and readaptation • Institutional protection from interruptions
	Professional Development	• Continuous training and recertification • Structured mentorship for new staff
	Technology	• Interoperability of information systems • Integration of Early Warning Scores (NEWS)

Source: The authors (2025).

Triage Contribution

Nurses identified triage as a fundamental mechanism for clinical risk management. Beyond mere categorisation, the process is valued for its capacity to define safe waiting times appropriate to clinical severity:

Triage, as recommended and standardised, is indeed an added value [...]. The triage process helps us understand the severity of the patient's condition and, on that basis, define an appropriate observation time. (P10)

Factors Influencing Decision-Making

Clinical decision-making revealed itself as a dynamic process, conditioned by the interaction between human capital, the limitations of decision-support algorithms, and the organisational environment.

Human Capital

Professional experience emerged as the most robust predictor of a safe decision, affording the nurse the confidence required to interpret the clinical picture beyond basic discriminators:

I think that experience is, without a doubt, the factor that defines triage [...]. The more experience you have, the better the triage. (P3)

Although specialised training is valued, participants emphasised that theoretical knowledge requires practical consolidation to be effective in the urgent care setting:

[Training] ensures confidence and quality in the decision [...]. It cannot be dissociated from experience. In other words, the transition from the theory to the practice is extremely important. (P5)

Clinical Challenges and System Limitations

Nurses frequently reported the need to integrate the patient's medical history into the decision to avoid under-triage (underestimated risk), bridging gaps in the standardised protocol:

The patient's medical history is not always included in the protocol, but it's always considered in our decision. (P1)

Structural weaknesses were identified in the MTS, specifically regarding the subjectivity of pain assessment and the rigidity of certain flowcharts. The case of diabetic patients with pre-hospital reversed hypoglycaemia was highlighted as a critical safety risk, where the protocol may suggest a low priority ("Green") for an unstable patient:

The patient [...] arrives with an IV glucose infusion and has a blood glucose of 150mg/dl. According to the Manchester triage, the patient is classified as green [...]. We are talking about a patient who, if the fluids run out [...], can quickly enter into a hypoglycaemic coma. There is a discrepancy between red and green... (P5)

Furthermore, the absence of physiological discriminators such as diaphoresis or respiratory rate compels nurses to perform defensive "over-triage":

Pallor isn't a discriminator on the MTS, nor is diaphoresis. Sometimes, if I perceive that the patient is not well, I tend to overtriage. (P7)

Organisational Context

The working environment exerts a direct influence on clinical judgement. Overcrowding and the perception of waiting times can condition, sometimes subconsciously, the assignment of priorities to manage patient flow:

They consider the overall situation, how many hours of waiting time [...] and I know that many times the decision is either inflated or deflated because of that. (P1)

Strategies for Management and Quality Improvement

Participants delineated strategies focused on clinical governance, professional development, and technological support.

Quality & Governance

The implementation of regular audits was suggested as a tool for accountability and continuous learning, allowing for the review of complex cases:

Maybe, it would be good to have regular audits and then bring those cases up again during training. (P7)

Professional Development

Structured clinical supervision for new nurses was identified as essential for safety during the induction period:

The nurse performing triage should work under supervision for 15 days to a month. (P2)

Technology

To support the decision, the integration of complementary tools, such as the National Early Warning Score (NEWS), was proposed following the initial triage.

At a technological level, the interoperability of information systems is required to guarantee immediate access to therapeutic history, thereby reducing clinical uncertainty. Finally, the need for institutional support to protect the triage nurse from external interruptions was highlighted:

There should be an order from the team leader [...] stating that the nurse performing triage cannot be disturbed. (P8)

DISCUSSION

This study explored the perceptions of ten nurses about their decision-making in emergency department triage, identifying key influencing factors and potential improvement strategies. The findings suggest that triage is understood as a complex clinical judgment process shaped by individual, patient-related, systemic, and organisational dimensions, with direct implications for patient safety.

The central role of human capital in triage safety is well established in the literature, and the present findings contribute a more detailed understanding. Nurses with greater clinical exposure demonstrated not only more accurate decisions, but also a qualitatively different reasoning process, one that integrates algorithmic discriminators with contextual clinical judgement¹²⁻¹³.

Notably, the perceived value of formal training was mediated by experience level: less experienced nurses attributed greater weight to theoretical qualification, whereas senior nurses viewed training as valuable only when consolidated through clinical practice. This divergence is consistent with previous reviews highlighting the interdependence between formal training and clinical exposure in triage competency development¹⁴. These findings have important implications for nursing management, as they suggest that losing experienced staff represents a depletion of safety capital that cannot be immediately offset by recruitment or training programmes alone. The findings reinforce the position of the Ordem dos Enfermeiros, which advocates that triage should be performed by a specialist nurse with expertise in critical patient care¹⁵.

The integration of past medical history into triage judgements, even when not explicitly required by protocol, reflects a well-documented adaptive behaviour in experienced nurses, who expand their clinical reasoning beyond algorithmic boundaries to mitigate under-triage risk¹⁶. These findings gain relevance when considered alongside the structural limitations of the MTS identified in this study.

However, significant limitations within the standardised triage system were identified. The subjectivity inherent in pain assessment represents a recognised vulnerability of standardised triage tools, with evidence linking it to inefficient resource allocation and increased overtriage rates¹⁷.

More critically, the rigidity of certain flowcharts poses latent safety risks that extend beyond individual judgment. The "Diabetes" flowchart is a paradigmatic example: evidence indicates that the risk of recurrent hypoglycaemia persists for up to 24 hours following an episode, particularly after insulin administration¹⁸, a clinical reality that a protocol-driven classification fails to capture.

The absence of key physiological discriminators from the standard MTS further compounds this vulnerability. Respiratory rate is a sensitive early marker of clinical

deterioration¹⁹, and diaphoresis is closely associated with haemodynamic compromise²⁰, yet neither is embedded in the system. Their exclusion leaves nurses with two suboptimal alternatives: rely on intuition or default to defensive overtriage to ensure patient safety. A parallel limitation emerges with chronic obstructive pulmonary disease patients, whose baseline dyspnoea may trigger inappropriately high priority classifications, undermining the system's specificity for chronic conditions²¹.

Clinical judgement in triage is inherently shaped by the organisational context, and the present findings illustrate how systemic pressures can silently distort priority assignment. The influence of overcrowding on decision-making is particularly concerning because, as participants acknowledged, its effect on triage is often subconscious, meaning that flow-driven bias may operate below the threshold of deliberate awareness^{7,22}.

Beyond patient flow, the physical and cognitive environment of the triage area introduces additional layers of vulnerability. Environmental stressors such as noise and insufficient natural light have been associated with cognitive fatigue and reduced decision accuracy²³⁻²⁴, while external interruptions during assessment disrupt the focused reasoning that safe triage demands²⁵. Together, these factors suggest that triage safety is not solely a function of individual competence but is co-produced by the organisational conditions in which decisions are made.

The strategies for improvement proposed reflect a sophisticated understanding of the systemic nature of triage risk, addressing governance, technology, and human factors in an integrated manner. Regular auditing emerges not merely as an accountability mechanism, but as a vehicle for collective learning, transforming complex or atypical cases into shared knowledge that strengthens institutional memory²⁶.

The proposed integration of the National Early Warning Score (NEWS) following initial triage represents a clinically grounded response to the subjectivity limitations identified earlier, particularly given evidence linking its implementation to reductions in cardiac arrests and hospital length of stay²⁷. This offers an objective anchor to complement protocol-driven classification. Similarly, the demand for interoperability between pre-hospital and in-hospital information systems addresses a structural gap with direct safety implications, as fragmented information transfer remains a recognised source of clinical uncertainty and error²⁸.

These findings carry concrete implications for nursing management. To translate these findings into practice, nurse managers should consider the following actionable strategies:

- **Clinical Governance and Local Protocols:** Managers must recognise the limitations of standard algorithms. Governance bodies should approve local protocols that mandate the use of objective adjuncts (e.g., NEWS) and support nurses who upgrade priority based on clinical concern, mitigating the risks identified regarding diabetic or respiratory patients.
- **Workforce Development:** Given the reliance on "experience," managers should move beyond ad-hoc supervision. Implementing structured mentorship programmes is essential. Evidence-based mentorship improves clinical processes and professional development²⁹, bridging the gap between theory and practice for novice nurses.
- **Safety Culture and Leadership:** Leadership must actively protect the triage process. Implementing policies that restrict non-clinical interruptions²⁵ is a low-cost managerial intervention to preserve the cognitive focus required for accurate triage.

This study has limitations inherent to its qualitative design. The use of a convenience sample from a single institution in northern Portugal means findings cannot be statistically generalised to other settings. Additionally, the principal investigator was undertaking

an internship at the study site. While measures of rigour, such as triangulation by three investigators, were employed to ensure trustworthiness⁸, the potential for familiarity bias must be acknowledged. However, the consistency of the themes with international literature suggests a high degree of transferability to other emergency departments facing similar resource constraints.

FINAL CONSIDERATIONS

Nursing decision-making in triage is a complex, multifactorial process where professional experience acts as the primary buffer against the limitations of standardised protocols and organisational pressures. This study highlights that while the Manchester Triage System provides structure, it requires the mediator of human expertise, specifically specialist qualifications and critical thinking, to ensure patient safety, particularly in ambiguous clinical presentations like pain or unstable diabetes.

For nursing management, the findings underscore that safety cannot rely on protocols alone. Organisations must invest in robust clinical governance through regular audits and procedure revisions, and transition from informal supervision to structured mentorship programmes. By protecting the triage environment from interruptions and valuing the specific expertise required for this role, healthcare leaders can significantly enhance the accuracy and safety of emergency care. Future research should now focus on quantifying the impact of these mentorship interventions on adverse event reduction.

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