

Scoping Review on Challenges and Barriers in Triage Education for Emergency Nurses



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Table S1. PRISMA-ScR checklist.

Section	Item	PRISMA-ScR Checklist Item	Reported on Page #
TITLE	1	Identify the report as a scoping review.	Page 1
ABSTRACT	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions.	Page 1
INTRODUCTION	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	Pages 1-2
INTRODUCTION	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population, concepts, and context).	Page 2
METHODS	5	Indicate whether a review protocol exists; state if and where it can be accessed.	Page 2
METHODS	6	Specify characteristics of the sources of evidence used as eligibility criteria and provide a rationale.	Page 2
METHODS	7	Describe all information sources in the search and the date last searched.	Page 2
METHODS	8	Present the full electronic search strategy for at least one database, including any limits used.	Supplementary File 1
METHODS	9	State the process for selecting sources of evidence (screening and eligibility).	Page 2
METHODS	10	Describe the methods of charting data from included sources of evidence.	Page 2
METHODS	11	If done, provide a rationale for conducting a critical appraisal of included sources of evidence.	Not applicable
METHODS	12	Describe the methods used for synthesis of results.	Page 2
RESULTS	13	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	Page 3 (Fig. 1)
RESULTS	14	Cite the characteristics of each source of evidence and provide the citations.	Pages 3-5
RESULTS	15	If done, present data on critical appraisal of included sources of evidence.	Not applicable
RESULTS	16	Present the relevant data that were charted from each included source of evidence.	Table 1; Table 2; Supplementary Table S2
RESULTS	17	Summarize and/or present the charting results as they relate to the review questions and objectives.	Pages 3-5
DISCUSSION	18	Summarize the main results, including an overview of concepts, themes, and types of evidence available.	Pages 4-5
DISCUSSION	19	Discuss the limitations of the scoping review process.	Page 5
DISCUSSION	20	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	Pages 4-5
FUNDING	21	Describe sources of funding for the included sources of evidence, where applicable, and describe the role of the funders.	Page 6

Table S2. Detailed data extraction matrix.

Study (Author, Year)	Country	Study Design	Barrier Types (P/E/S)	CTAS Implications	Key Findings
Alquraini <i>et al.</i> (2015) [10]	Saudi Arabia	Reliability Study	P, S	Reliability and accuracy of CTAS implementation	Identified variability in triage scoring among nurses and emphasized the need for structured CTAS education and competency assessment.
Li <i>et al.</i> (2018) [16]	China	Meta-analysis	S	Burnout negatively impacts triage performance	High levels of emergency nurse burnout were associated with reduced cognitive performance and impaired clinical judgment during triage.
Hardy & Calleja (2019) [17]	Australia	Scoping Review	S	Rural and remote CTAS training limitations	Highlighted inconsistencies in triage education and lack of standardized educational resources in remote emergency settings.
Bijani & Khaleghi (2019) [14]	Iran	Qualitative Study	P, E	Environmental and competency-related CTAS barriers	Reported that overcrowding, interruptions, and insufficient expertise significantly affected triage quality and decision-making.
Duko <i>et al.</i> (2019) [12]	Ethiopia	Cross-sectional Study	P, S	Knowledge deficits in emergency triage	Found that inadequate triage knowledge and insufficient training contributed to inaccurate prioritization and delays in care.
Reay <i>et al.</i> (2020) [20]	Canada	Qualitative Study	S	Interprofessional communication challenges	Demonstrated that poor communication and inconsistent handover processes negatively influenced emergency triage decisions.
Rosenberg (2019) [21]	USA	Review	S	Staffing shortages affecting triage safety	Identified nursing shortages as a major contributor to rushed triage decisions, fatigue, and patient safety concerns.
Delmas <i>et al.</i> (2020) [15]	France	Quasi-experimental Study	E	Environmental distractors reduce triage accuracy	Showed that noise, interruptions, and emergency department distractions impaired triage accuracy and nurse concentration.
Salifu <i>et al.</i> (2022) [13]	Ghana	Mixed-methods Study	S	Simulation-based education in low-resource settings	Demonstrated that simulation-based education improved confidence and competency despite infrastructural limitations.
Soola <i>et al.</i> (2022) [22]	Iran	Cross-sectional Study	P	Decision-making variability in triage	Found that nurse experience and Benner's competency levels strongly influenced triage consistency and accuracy.
Al-Thobaity <i>et al.</i> (2024) [11]	Saudi Arabia	Mixed-methods Study	P, S	CTAS implementation barriers in Saudi Arabia	Identified cultural communication barriers, limited institutional support, and inconsistent training as major obstacles in CTAS practice.
Ouellet <i>et al.</i> (2025) [18]	Canada	Systematic Review	S	Strategies to improve CTAS quality	Reported that standardized education, simulation, and continuing competency programs significantly improved triage quality and reliability.

Legend:

P = Professional barriers

E = Environmental barriers

S = Systemic barriers.