

Barriers and Facilitators to Implementing CPGs: A Systematic Review Using the CFIR Framework

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Background

Clinical Practice Guidelines (CPGs) are central to ensuring consistent, evidence-based care in ambulance services. They provide paramedics with structured support for clinical decision-making in dynamic and resource-limited environments. Despite their importance, implementation of CPGs is often inconsistent, influenced by contextual and organisational barriers such as resource constraints, workforce variability, and resistance to change. Understanding these barriers and facilitators is critical to improving uptake and patient outcomes.

Aim

To systematically identify the barriers and facilitators affecting the implementation of CPGs in ambulance services, and to map these determinants against the Consolidated Framework for Implementation Research (CFIR).

Method

- Design: Mixed-methods systematic review, conducted using Joanna Briggs Institute (JBI) methodology.
- Protocol: Registered with PROSPERO (CRD42024580204).
- Databases: MEDLINE, EMBASE, CINAHL, Scopus, Web of Science, Cochrane Library, and JBI Database.
- Inclusion: Studies published in the last 20 years, covering qualitative, quantitative, and mixed-methods designs.
- Final sample: Analysed using a convergent integrated approach with findings mapped to CFIR domains.

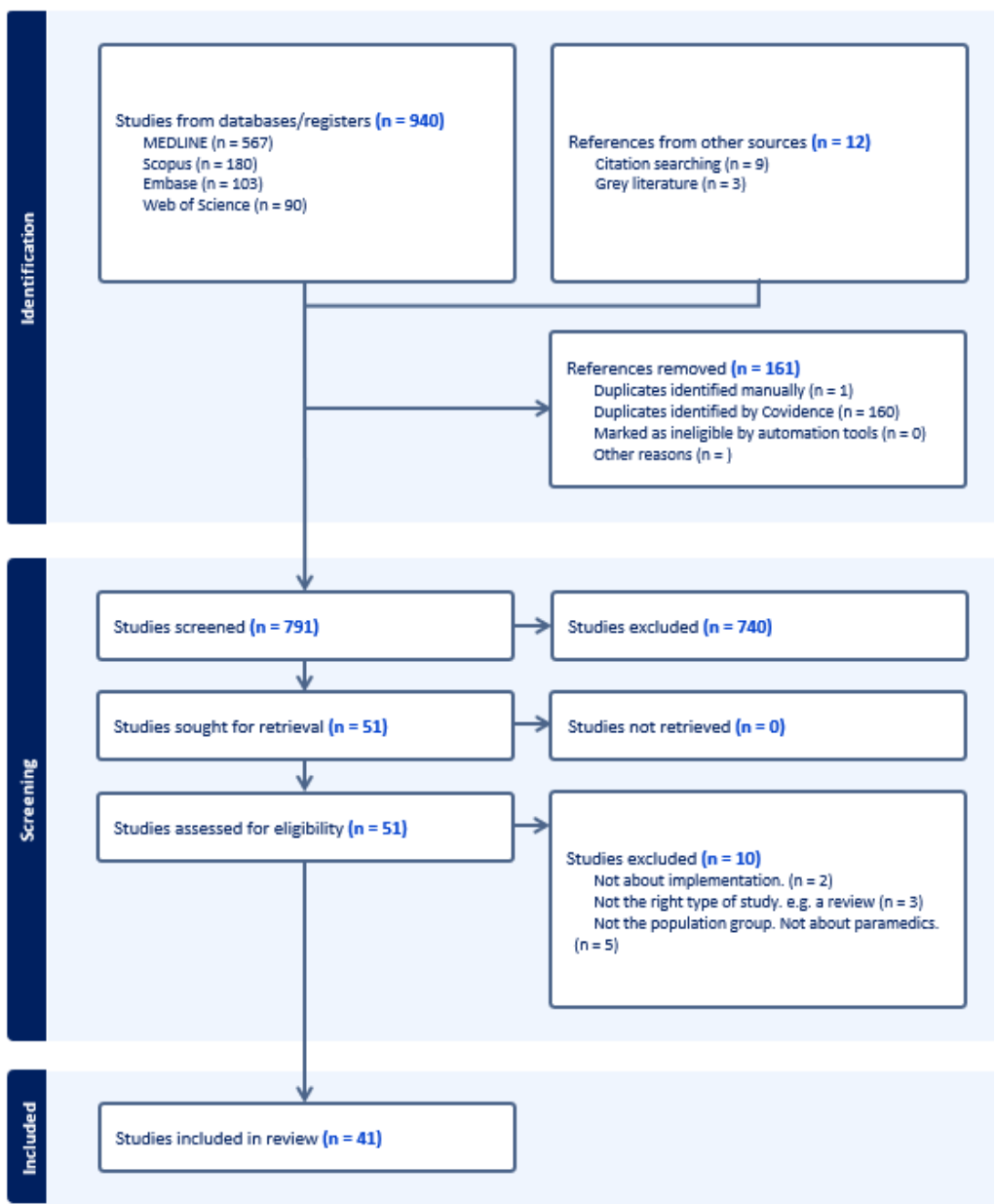


Figure 1. PRISIMA

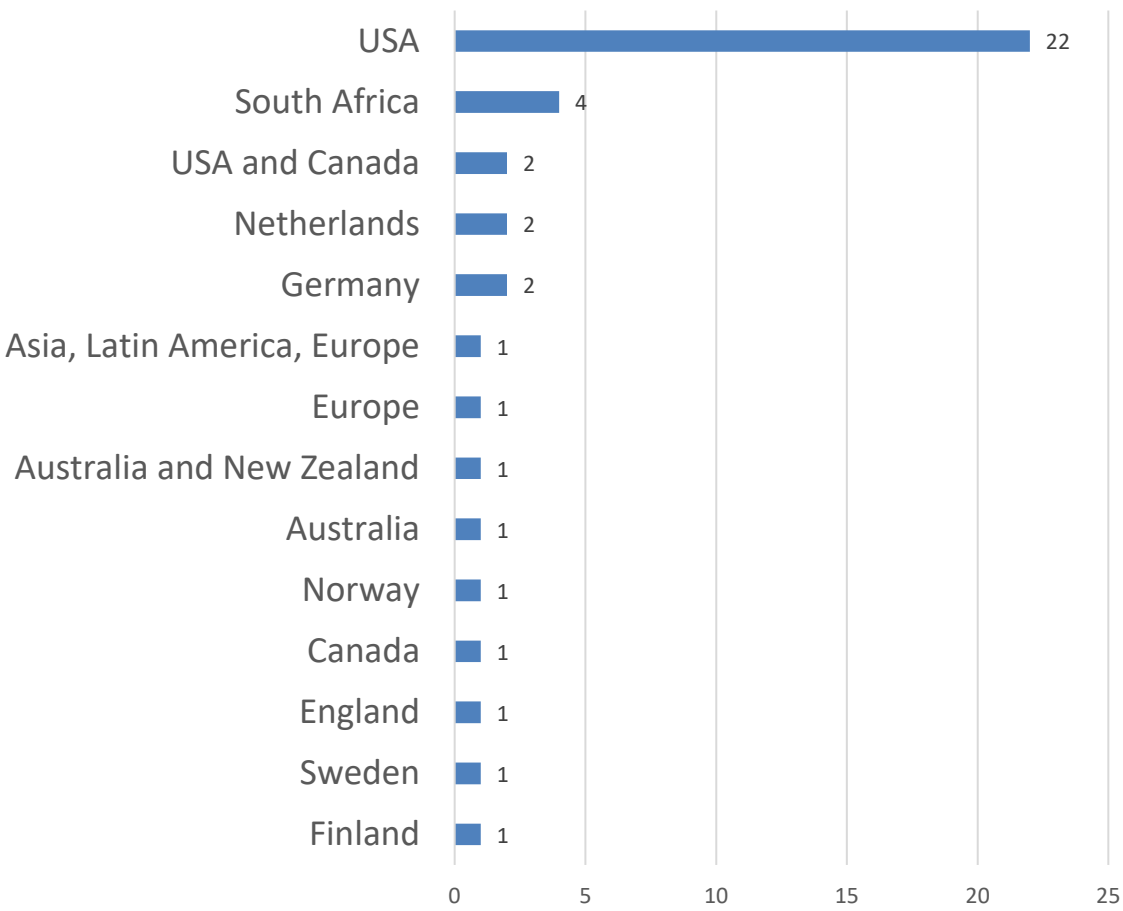


Figure 2. Distribution of studies by Country

Results

A total of 41 studies were included, spanning qualitative, quantitative, and mixed-methods designs across diverse ambulance service contexts. Findings highlighted wide variation in how Clinical Practice Guidelines (CPGs) are adopted and sustained, with key determinants identified across all five domains of the Consolidated Framework for Implementation Research (CFIR).



Intervention Characteristics: Complexity was a consistent barrier, with lengthy or cognitively demanding protocols poorly adhered to in time-critical care. In contrast, adaptable and context-sensitive guidelines, tailored to workforce capacity and local resources, were strong facilitators.

Inner Setting: Organisational readiness and infrastructure shaped uptake. Agencies with established training systems and decision-support tools reported higher compliance, while leadership engagement proved critical in driving adherence and sustainability. Culture also mattered: collaborative environments enabled smoother adoption, whereas entrenched practices limited change.

Outer Setting: External pressures such as regulatory mandates and policy frameworks encouraged adherence and consistency. Hospital partnerships and inter-agency collaborations facilitated implementation of time-sensitive protocols. However, rural and remote services faced persistent resource disparities that restricted uptake.

Characteristics of Individuals: Paramedics' knowledge, skills, and confidence strongly influenced implementation. Simulation-based training and structured feedback improved confidence and adherence, though overconfidence among experienced staff sometimes led to deviations. Generational and attitudinal differences also shaped acceptance of guidelines.

Process: Structured rollouts, pilot programs, and stakeholder engagement promoted ownership and improved adoption. Ongoing audit and feedback loops, supported by digital tools such as electronic patient care records (ePCRs), were essential for embedding guidelines into practice and sustaining long-term compliance.

Discussion

This review shows that the implementation of Clinical Practice Guidelines (CPGs) in ambulance services is influenced by a complex interplay of contextual, organisational, and individual factors. Mapping findings to the CFIR framework revealed that success depends on coordinated attention across all domains, rather than addressing barriers in isolation.

Intervention Design & Adaptability

- Overly complex or resource-intensive guidelines were less likely to be adopted.
- Adaptable, context-specific protocols, co-designed with end-users, improved adherence and confidence.
- Tailoring guidelines to local capacity is particularly critical in rural and under-resourced services.

Leadership & Organisational Culture

- Leadership engagement was one of the strongest drivers of successful implementation.
- Leaders who prioritised training, accountability, and guideline use achieved higher adherence.
- Collaborative, team-based cultures facilitated adoption; entrenched practices and resistance among experienced staff hindered it.

External Pressures & Resource Disparities

- National and regional mandates supported guideline uptake and consistency.
- Hospital and inter-agency partnerships strengthened adherence for time-sensitive protocols (e.g., stroke, STEMI, cardiac arrest).
- Persistent rural-urban disparities limited uptake, with smaller services constrained by funding, training, and equipment shortages.

Clinician Knowledge, Confidence & Attitudes

- Training gaps, especially in paediatric and trauma care, limited effective application.
- Simulation-based training and structured feedback improved confidence and adherence.
- Generational and attitudinal differences persisted: younger clinicians tended to embrace guidelines, while some experienced staff relied on personal judgement.

Implementation Processes

- Structured approaches — including phased rollouts, pilot programs, and stakeholder engagement — enhanced ownership and adherence.
- Regular audits, feedback loops, and digital tools (e.g., ePCRs, decision-support systems) sustained long-term compliance and embedded guidelines into daily workflows.

Conclusion & Implications

Successful implementation of CPGs in ambulance services requires coordinated, multi-level strategies:

- Leadership and organisational culture are critical drivers of uptake and sustainability.
- Adaptable, context-sensitive guidelines achieve higher adherence than rigid protocols.
- Equitable resource allocation is essential to address persistent rural and under-resourced disparities.
- Ongoing training, simulation, and feedback build clinician confidence and support compliance.
- Structured processes and digital tools strengthen sustainability and reduce variability in practice.

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