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Collaboration between ambulance services and primary care: a scoping review protocol

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ABSTRACT

Introduction Making decisions about the appropriate level of care is a significant challenge for healthcare professionals, especially when older patients present with diffuse symptoms. Collaboration between ambulance services and primary care may promote a comprehensive understanding of patient needs. However, such collaboration remains limited, potentially leading to lower care quality and higher costs. There is a need to understand how collaboration can be effectively implemented. This scoping review aims to explore existing models of collaboration between ambulance services and primary care, identifying their characteristics, outcomes and current research gaps.

Methods and analysis This scoping review will follow the methodological framework proposed by Arksey and O'Malley, supplemented with recommendations from the Joanna Briggs Institute Handbook for Scoping Reviews. A comprehensive literature search will be conducted in PubMed, CINAHL, Web of Science and Scopus. In addition, Google Scholar, Overton, SwePub and the Swedish national library database Libris will be searched for relevant grey literature. The review will include studies published from January 2014 to the present. Data will be analysed descriptively, with findings categorised by collaboration models and patterns identified through inductive analysis to address the research questions. The review will apply the Preferred Reporting Items for Systematic Review and Meta-Analysis extension for Scoping Reviews to present the results.

Ethics and dissemination This review is the first stage of an overarching research study to develop a model for extended collaboration between ambulance services and primary care (the ECAP project). Results will be disseminated through peer-reviewed publications, conference presentations and sharing with ambulance services and primary care stakeholders to inform practice and policy. This scoping review protocol has been registered on the Open Science Framework (https://osf.io/nrkm5/). No participants will be involved at this stage, and the selected literature is publicly available, so no ethical approval will be required for this scoping review.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This study will employ a comprehensive search strategy to systematically explore collaboration models between ambulance services and primary care, aiming to uncover key characteristics and identify existing research gaps.
⇒ The search strategy will be designed with professional librarians to ensure a thorough and inclusive approach to published research and grey literature sources.
⇒ The study will follow the established and systematic methods of Arksey and O'Malley, supplemented with recommendations from the Joanna Briggs Institute Handbook for conducting scoping reviews, adhering to the Preferred Reporting Items for Systematic Review and Meta-Analysis extension for Scoping Reviews guidelines.
⇒ There will be no formal assessment of the quality of included studies, which is a common limitation in scoping reviews, potentially affecting the reliability of the collected data.

INTRODUCTION

Ambulance care often serves as one of the initial points of contact for older patients experiencing acute health issues.[1–4] Deciding on the appropriate care level is a significant challenge for ambulance services.[5–9] For ambulance clinicians, it is vital to have adequate support in these situations. They rely on experience, collegial support, decision support and care guidelines for assessment.[10–12] However, these forms of support are often insufficient, especially with older patients who may exhibit atypical symptoms, such as a lack of fever in infections.[13] Collaboration with general practitioners in primary care could offer valuable support, but such collaboration is limited within Swedish healthcare.[6 14] Collaboration can play a crucial role in supporting clinical decision-making. Primary care physicians often face difficulties when deciding whether frail older adults require hospitalisation.[15] Further research is needed to study how clinicians can work with other stakeholders to reach consensus in

decision-making. In this project, primary care refers to first-contact health services, which include general practitioners, community-based services, home care and other outpatient services that are essential for continuous and coordinated care, especially for patients with chronic or complex care needs.

Worldwide, ambulance services operate in situations characterised by rapid decision-making in complex and unpredictable settings, where advanced care must often be provided with limited access to higher medical support.[16–20] Errors in clinical reasoning and decision-making are among the primary threats to patient safety, as decisions made during ambulance care have a significant impact on the outcome of subsequent care.[21 22] In such high-stakes environments, the use of structured protocols and decision support tools, as well as adherence to clinical guidelines, is essential for promoting consistent and high-quality care.[23] Across many healthcare systems, ambulance teams are not only responsible for patient assessment but also play a critical role in navigating intricate care pathways and determining whether patients require hospital transport or can be safely referred to alternative levels of care, such as primary care or community-based services.[9 24] In some countries, such as the USA, Canada and Australia, these decisions are typically made by paramedics who may have limited autonomy in referring patients or providing advanced care without hospital input.[25–27]

In contrast, Swedish ambulance services operate with a unique model that integrates a high level of medical and nursing competence within their teams. Each ambulance team is staffed with at least one registered nurse, often with specialist training in pre-hospital emergency care.[28] This structure enables Swedish ambulance clinicians to make informed and holistic decisions about patient care pathways. Such decisions are supported by their comprehensive education in nursing, equipping them with a solid foundation in healthcare, ethics and a holistic perspective grounded in caring science.[29–31] Swedish ambulance nurses have the authority to assess and decide if a patient can be managed within primary care settings rather than requiring hospital transport, reflecting a high level of clinical autonomy.[28] This integrated model aligns with the broader trend towards enhancing out-of-hospital care, reducing unnecessary hospital admissions and improving continuity of care.

Globally, as the complexity of ambulance care continues to increase, the need for specialised skills and robust decision-making frameworks will become even greater. The Swedish model, which emphasises advanced clinical decision-making by specialised ambulance nurses, provides an example of how structured protocols, clinical expertise and collaboration can contribute to high-quality care.[28] However, decisions regarding care pathways, particularly non-conveyance, remain complex and are prone to misjudgement. The COVID-19 pandemic underscored the importance of non-traditional solutions and extensive non-conveyance decisions to improve care efficiency.[32 33] Yet, navigating these pathways can be challenging,[34–36] especially when symptoms are ambiguous or when immediate support from other healthcare providers is limited. Making accurate and timely decisions in dynamic, unpredictable settings continues to pose significant challenges.

As demographics shift, healthcare systems worldwide struggle to accommodate a growing number of older individuals with multifaceted health conditions. Ageing is strongly related to multimorbidity, defined as having two or more chronic or acute diseases.[37 38] In Sweden, nearly 80% of those over 85 years old live with multimorbidity,[39] necessitating healthcare systems adept at addressing both the immediate and long-term needs of older patients effectively. Continuity of care is a fundamental healthcare principle ensuring that services are seamless, coherent and interconnected across various levels and over time.[40] Enhanced collaboration and integrated care models that effectively bridge organisational boundaries have been shown to improve outcomes for older adults with acute needs, underscoring the importance of continuity of care.[8]

Primary care plays a central coordinating role, enabling continuity of care over time by managing ongoing health issues, providing preventive care and facilitating necessary post-emergency follow-ups. Despite its pivotal role,[41] primary care integration is often underused, leading to fragmented care and suboptimal outcomes.[42 43] The importance of collaboration for patients, families and healthcare professionals is well documented.[44–48] Robust collaborative care models are essential for ensuring continuity of care, enhancing patient satisfaction and improving health outcomes. Lack of collaboration is linked to decreased care quality and efficiency, increased costs and limited opportunities to achieve a holistic understanding of patient needs, especially in older patients.[49]

The current healthcare landscape with an ageing population necessitates robust models of collaboration to ensure continuity of care. However, there is limited knowledge of models of collaboration between ambulance services and primary care. This scoping review aims to fill that gap by exploring existing models of collaboration between ambulance services and primary care, identifying their characteristics, outcomes and current research gaps.

METHODS AND ANALYSIS

Design

This scoping review will apply Arksey and O'Malley's framework,[50] consisting of six steps: (1) identifying the research questions; (2) identifying relevant studies; (3) selecting studies; (4) charting the data; (5) collating, summarising and reporting results; and (6) consultation with stakeholders. This approach was chosen as it outlines current evidence and identifies knowledge gaps. To enhance rigour, elements from the Joanna Briggs Institute (JBI) Handbook for Scoping Reviews will also be incorporated,[51 52] particularly in the methodological approach to study selection, data extraction and

Table 1 Population Concept Context framework for eligibility criteria in the scoping review on collaboration between ambulance services and primary care

Population	Studies involving patients of all ages receiving joint care from ambulance services and primary care providers, or healthcare providers engaged in such collaborative care. No restrictions will be applied regarding the types of conditions presented.
Concept	The review seeks to capture the variety of collaborative practices between ambulance services and primary care, including any documented models, interventions designed to improve collaboration, and perceived barriers to and facilitators of effective collaboration.
Context	Studies will be included irrespective of geographical location to provide a comprehensive overview of collaborative practices between ambulance services and primary care. Both urban, rural and remote areas will be considered. Only materials published in English or Swedish will be included due to resource and translation constraints.

stakeholder engagement. This protocol has been developed in accordance with the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) guidelines.[53] A completed PRISMA-P checklist is provided as online supplemental appendix 1.

Step 1: identifying the research questions

The central research question guiding this review is: 'What literature is available on collaboration between ambulance services and primary care?' The following subquestions will help further explore this topic in the eligible studies applying criteria based on the Population Concept Context framework[52] (refer to table 1):

1. What models of collaboration between ambulance services and primary care are described in the international literature?
2. What are the main characteristics of these models in different healthcare systems?
3. How do these models impact patient care, healthcare delivery and outcomes?
4. What gaps exist in the current literature, and what areas require further investigation?

Step 2: identifying relevant studies

The literature search will be done using multiple electronic databases, including PubMed, CINAHL, Web of Science and Scopus. Additionally, searches will be conducted in grey literature sources to ensure comprehensive coverage of the topic, following JBI guidance on comprehensive searches.[51] Specifically, grey literature will be identified through searches in Google Scholar, Overton, SwePub and Libris, the Swedish national library database, which provides access to a wide range of publications, research reports, and policy documents.

To develop a robust search strategy, we first conducted an exploratory search in PubMed to identify relevant terms and synonyms used in the literature. This exploratory search informed the development of a draft search strategy, which is presented in table 2 as the first complete search conducted in PubMed. The draft search strategy was developed in collaboration with professional librarians and aimed to ensure the inclusion of relevant synonyms, alternative terms and variations in terminology. Boolean operators, truncations and phrase searching were applied to refine the search.

The search strategy will be further developed with assistance from professional librarians and independently peer-reviewed using the tool Peer Review of Electronic Search Strategies.[51] It will also be informally peer-reviewed by healthcare professionals with experience in collaboration between ambulance services and primary care to validate its scope and relevance to the research questions. The strategy will also be adapted for each database and source to optimise retrieval.

Step 3: selecting studies

A comprehensive exploration of the literature on collaboration between ambulance services and primary care will be conducted. The reference list and forward citations of eligible articles will be searched to locate any additional material not discoverable in the initial search. Eligible materials must discuss or evaluate models of collaboration, barriers or facilitators to collaboration, or outcomes of such collaborations. This scoping review will include various study designs, including quantitative, qualitative, mixed-methods and reviews (eg, systematic, narrative or scoping reviews), to emphasise practical application and maintain methodological flexibility. Works not related to ambulance and primary care collaboration, as well as editorials or opinion pieces lacking original data, will be excluded. This review will include materials published within the last 10 years (January 2014 to the present). The 10-year time frame was chosen to ensure a balance between capturing recent, relevant research and maintaining a manageable scope.

After the search, the results will first be exported into EndNote[54] for data management, including removing duplicates and organising references. After this initial processing, the studies will be imported into Rayyan QCRI (Qatar Computer Research Institute)[55] for the screening process. The screening will be conducted in two stages: (1) a title and abstract review of all results and (2) a full-text review of selected articles, following the JBI framework.[51] To ensure consistency, the inclusion and exclusion criteria will be piloted on a subset of studies and refined as necessary before the full screening process.[52] Three reviewers will independently screen all titles and abstracts within Rayyan using the platform's blinded screening feature to reduce bias and ensure consistency. This process will consist of two phases: (1) an initial screening

Table 2 Presentation of the first complete search performed in PubMed on December 14 2024

#	Area of interest	Search terms	No of hits
S1	Ambulance services	("ambulance*"[Title/Abstract] OR "emergency health service*"[Title/Abstract] OR "emergency medical technician*"[Title/Abstract] OR "emergency medicine technician*"[Title/Abstract] OR "EMTs"[Title/Abstract] OR "EMT"[Title/Abstract] OR "emergency medical service*"[Title/Abstract] OR "EMS"[Title/Abstract] OR "emergency mobile unit*"[Title/Abstract] OR "medical emergency service*"[Title/Abstract] OR "mobile emergency unit*"[Title/Abstract] OR "paramedic*"[Title/Abstract] OR "prehospital*"[Title/Abstract] OR "pre hospital*"[Title/Abstract] OR "pre hospital"[Title/Abstract] OR ("Emergency Medical Services"[MeSH Terms] OR "Emergency Medical Technicians"[MeSH Terms] OR "Emergency Medicine"[MeSH Terms] OR "Paramedicine"[MeSH Terms] OR "Paramedics"[MeSH Terms]))	259 302
S2	Primary care	("community health nurs*"[Title/Abstract] OR "GPs"[Title/Abstract] OR "GP"[Title/Abstract] OR "Domiciliary Care"[Title/Abstract] OR "general practi*"[Title/Abstract] OR "health visitor*"[Title/Abstract] OR "healthcare centre*"[Title/Abstract] OR "home care"[Title/Abstract] OR "home health care"[Title/Abstract] OR "home nurs*"[Title/Abstract] OR "home health nurs*"[Title/Abstract] OR "municipal care personnel*"[Title/Abstract] OR "municipal staff"[Title/Abstract] OR "nurse* aide*"[Title/Abstract] OR "nurs* auxiliar*"[Title/Abstract] OR "nurse assistants"[Title/Abstract] OR "nursing home*"[Title/Abstract] OR "primary care"[Title/Abstract] OR "Primary Health Care"[Title/Abstract] OR "primary healthcare"[Title/Abstract] OR "satellite center*"[Title/Abstract] OR "visiting nurse*"[Title/Abstract] OR ("Community Health Centers"[MeSH Terms] OR "Community Health Services"[MeSH Terms] OR "General Practitioners"[MeSH Terms] OR "Home Care Services"[MeSH Terms] OR "Home Health Nursing"[MeSH Terms] OR "nurses, community health"[MeSH Terms] OR "Nursing Homes"[MeSH Terms] OR "Primary Care Nursing"[MeSH Terms] OR "Primary Health Care"[MeSH Terms]))	818 160
S3	Collaboration	("collaborat*"[Title/Abstract] OR "compliant behavior*"[Title/Abstract] OR "compliant behaviour*"[Title/Abstract] OR "cooperati*"[Title/Abstract] OR "co operati*"[Title/Abstract] OR "cross-functional"[Title/Abstract] OR "crossfunctional"[Title/Abstract] OR "Interdisciplinary"[Title/Abstract] OR "inter disciplinary"[Title/Abstract] OR "integrat*"[Title/Abstract] OR "inter professional"[Title/Abstract] OR "interprofessional"[Title/Abstract] OR "intersectoral"[Title/Abstract] OR "medical etiquette"[Title/Abstract] OR "multiprofessional"[Title/Abstract] OR "multi professional"[Title/Abstract] OR "multidisciplinary"[Title/Abstract] OR "multi disciplinary"[Title/Abstract] OR "partnership*"[Title/Abstract] OR "team*"[Title/Abstract] OR ("Cooperative Behavior"[MeSH Terms] OR "Intersectoral Collaboration"[MeSH Terms] OR "Interprofessional Relations"[MeSH Terms] OR "delivery of health care, integrated"[MeSH Terms]))	1 608 009
S4		S1 AND S2 AND S3	4376
S5		("English"[Language] AND 2014/01/01:2024/12/31[Date - Publication])	2211

of articles identified in the main search and (2) a supplementary screening of articles identified through reference lists and forward citations. To validate the process, all reviewers will consistently apply predefined inclusion and exclusion criteria. Blinded article selection in Rayyan will enable each reviewer to make independent decisions without being influenced by the other reviewers. After the initial screening, a consensus-building process will take place where any discrepancies between the reviewers' selections will be identified and discussed. To ensure reliability and reproducibility, the reviewers will test the process by independently screening a random sample of 10% of the articles before full screening. After completing this initial test, the reviewers will compare their results with each other to ensure that the inclusion and exclusion criteria are being interpreted and applied consistently. This process helps to minimise subjective differences and ensures consistency across all reviewers. The same validation process will apply to the articles selected for full-text review. Any conflicts in inclusion decisions will be highlighted, and the reviewers will engage in collaborative discussion until they achieve consensus. This systematic approach ensures that the selection process will be transparent and reproducible.

Finally, the research team will collectively agree upon the final list of included studies. Given the scoping review's aim to explore the breadth of literature rather than synthesise evidence for clinical practice, no formal critical appraisal or risk of bias assessment will be conducted. However, study design and evidence level will be considered during data synthesis. The final search results will be reported in a PRISMA flow diagram and will include all relevant literature identified.

Table 3 Data in the extraction matrix for studies on collaboration between ambulance services and primary care

Section	Data items
Bibliographic details	Authors, year, title, journal, country
Study objectives and methods	Study objectives, method, participants
Description of collaboration	Collaboration model, partners in collaboration
Main findings	Barriers identified, facilitators identified, outcomes of collaboration

Step 4: charting the data

Data will be charted using an extraction matrix developed explicitly for this review. The development of the extraction matrix was guided by the research questions and informed by examples from similar scoping reviews in the field. The matrix includes predefined sections such as bibliographic details, study objectives and methods, description of the collaboration and main findings (see table 3). The extraction tool will be piloted on a subset of studies to ensure relevance and usability.[51] The research team will refine it to align with the research questions or capture unexpected findings, provided the sections and data items remain comprehensive and relevant.

Step 5: collating, summarising and reporting results

Data will be analysed and summarised descriptively, with study characteristics presented in tabular and graphical forms, guided by the extraction chart.[50] Findings will be categorised as related to models of collaboration.[51] The research team will conduct an inductive analysis of the selected materials, examining the main focus of each paper to identify patterns and address the research questions. Co-investigators will independently review a subsample of the data to ensure consistency and reduce bias. Any discrepancies will be resolved collaboratively through group discussions. Findings will be reported in accordance with the PRISMA extension for Scoping Reviews guidelines[56] to ensure transparency and rigour in reporting.

Step 6: consultation with stakeholders

As part of the Arksey and O'Malley framework,[50] we will include a stakeholder consultation step to enhance the relevance and applicability of the review. Stakeholders, including healthcare professionals and healthcare leaders, will be engaged to provide insights, validate findings and identify any additional sources or gaps in the literature. This process will ensure that the review addresses real-world needs and strengthens the practical value of the findings for implementation in healthcare settings, as recommended by JBI guidance.[51] To recruit stakeholders, we will leverage an established network of healthcare professionals, healthcare leaders and researchers involved in an overarching project on collaboration between ambulance services and primary care. This network includes individuals with direct experience in ambulance or primary care, ensuring their insights are grounded in practical knowledge. Additional stakeholders will be recruited through professional organisations and consumer groups related to ambulance care and primary care.

Protocol registration

This protocol has been registered on the Open Science Framework (OSF) to ensure transparency and reproducibility of the research process (https://osf.io/nrkm5/).

IMPLICATIONS

To the best of our knowledge, this will be the first scoping review to explore models of collaboration between ambulance services and primary care, identifying key characteristics and research gaps. Enhanced collaboration between these services has the potential to reduce unnecessary hospital admissions, optimise resource utilisation and ensure safer transitions between levels of care. Additionally, improved collaboration may lead to increased patient safety, better continuity of care and valuable opportunities for skill development and knowledge exchange between healthcare professionals.

ETHICS AND DISSEMINATION

As the scoping review will be based on published literature and publicly available documents, additional ethical approval will not be required. However, careful attention will be given to accurately representing the findings and interpretations of the original studies, respecting the integrity of the primary research. The review will be conducted in accordance with ethical principles of research integrity, transparency and respect for the original sources.

This review is the first part of an overarching study aimed at enhancing collaboration between ambulance services and primary care in Sweden (the ECAP project). Given the current lack of collaboration, this review will provide a foundational context for broader studies on collaboration, potentially leading to greater dissemination of results in the future. To our knowledge, this will be the first scoping review to explore models of collaboration between ambulance services and primary care, identifying key characteristics and research gaps. The results will be disseminated through peer-reviewed publications, presentations at conferences and sharing with stakeholders in ambulance services and primary care to inform practice and policy.

The protocol for this scoping review has been registered on the OSF (https://osf.io/nrkm5/) to promote open science and enhance the transparency of the review process.

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