Review of Contemporary Philosophy
ISSN: 1841-5261, e-ISSN: 2471-089X
Vol 24 (01), 2025
pp. 962 - 971

Expanding the Role of Paramedics in Saudi Arabia: Current Evidence, Evolving Models, and Future Opportunities for Integrated Healthcare

[1]Mohammed Ahmed Alasmari*, [1]Mohammed Abdulrahman Alasmari, [2]Faris Salah Almutairi, [2]Khalaf Maged Alotaibi

[1] Prince Sultan Military Medical City, Riyadh 12233, Saudi Arabia

[2] Saudi Red Crescent Authority, Riyadh 11129, Saudi Arabia

Corresponding author:
Mohammed Ahmed Alasmari
Prince Sultan Military Medical City
Address: MPR7+7F2, Makkah Al Mukarramah Rd, As Sulimaniyah, Riyadh 12233
Phone: 011 477 7714
Email: m-a_1980@hotmail.com

ABSTRACT: Background: Paramedicine in Saudi Arabia has evolved rapidly in recent years, transitioning from a transport-focused emergency service to a developing clinical profession. This transformation aligns with the Kingdom's Vision 2030 Health Sector Transformation Program, which emphasizes preventive, integrated, and efficient healthcare delivery. Despite these advances, limited literature has synthesized evidence on the current status, challenges, and future directions of paramedic practice in Saudi Arabia.

Methods: A narrative review approach was adopted to examine peer-reviewed literature, policy documents, and grey sources published between 2010 and 2025. Searches were conducted in PubMed, Scopus, and regional databases using keywords related to "paramedic," "Emergency Medical Services," "Saudi Arabia," "community paramedicine," and "scope of practice." Studies were included if they discussed workforce development, education, role expansion, or policy within the Saudi or Gulf context. Findings were synthesized thematically and compared with international models.

Results: The review identified major progress in professional education, regulatory frameworks, and system modernization. However, the paramedic role in Saudi Arabia remains largely confined to emergency response. Evidence suggests growing interest in community-based and telehealth-enabled models, but widespread adoption is limited by regulatory, financial, and integration barriers. Challenges include uneven resource distribution, limited postgraduate education, and gaps in interprofessional collaboration.

Conclusion: Saudi paramedicine is at a critical juncture of transformation. Expanding the paramedic's scope toward community and preventive care could enhance access, efficiency, and equity. Strengthening regulation, education, and data systems will enable paramedics to contribute effectively to the Kingdom's Vision 2030 goals for a patient-centred and sustainable healthcare system.

Keywords: Paramedicine; Emergency Medical Services; Community Paramedicine; Mobile Integrated Healthcare; Saudi Arabia; Health Sector Transformation; Vision 2030; Prehospital Care

Received: 12 Sep 2025 **Received:** 24 Oct 2025 **Accepted:** 06 Nov 2025

1. Introduction

Over the last decade, Saudi Arabia has undergone a major transformation in its healthcare delivery system, driven by the objectives of Vision 2030 to enhance quality, efficiency, and accessibility of care (1). Emergency Medical Services (EMS) form a critical component of this transformation, serving as the first point of contact for acutely ill or injured patients (2). Historically, paramedics in Saudi Arabia were primarily regarded as transport technicians focused on rapid response and patient transfer. However, increasing healthcare demands, an ageing population, and the rise of chronic disease and injury burdens have underscored the need for an expanded paramedic role that extends beyond emergency response (3).

Globally, the paramedic profession has evolved toward integrated models of practice that emphasize prevention, early intervention, and continuity of care through initiatives such as community paramedicine and mobile integrated healthcare (MIH). These approaches empower paramedics to deliver home-based assessments, chronic-disease monitoring, and social support in collaboration with multidisciplinary teams. Within Saudi Arabia, similar innovations are emerging in pilot form, supported by national priorities to improve access to care in rural and underserved regions and to optimize resource utilization within hospitals and emergency departments (4, 5).

Despite these developments, literature examining paramedic role evolution in the Saudi context remains limited. Most available studies focus on response times, trauma care, or EMS system performance, while few explore the broader professional identity, educational frameworks, or integration with other health sectors (6). This review therefore aims to synthesize current evidence on paramedic practice in Saudi Arabia, highlight evolving models and challenges, and identify opportunities to align the profession with the Kingdom's health transformation agenda.

2. Methodology

This paper adopts a narrative review design to synthesize current evidence on the evolving role of paramedics in Saudi Arabia within the broader context of international paramedicine development. Unlike systematic reviews, narrative reviews are suitable for mapping conceptual progress, professional role expansion, and policy implications where heterogeneous literature and local contextual factors predominate.

Search Strategy

A structured search was conducted across multiple databases — PubMed, Scopus, ScienceDirect, and Google Scholar — covering publications between 2010 and May 2025. Keywords used in various combinations included paramedic, Emergency Medical Services, Saudi Arabia, community paramedicine, mobile integrated healthcare, prehospital care, EMS education, and scope of practice. Additional grey literature sources were reviewed, including Ministry of Health (MOH) policy reports, Saudi Red Crescent Authority (SRCA) publications, Vision 2030 Health Sector Transformation documents, and national academic theses.

Inclusion and Exclusion Criteria

Studies and reports were included if they: Discussed the roles, education, regulation, or system-level development of paramedics in Saudi Arabia or the Gulf region; Examined innovations such as community paramedicine, advanced practice paramedics, or integration with primary healthcare; Were available in English or Arabic. Excluded were purely clinical studies unrelated to workforce development or policy, duplicate records, and international papers with no relevance to the Saudi or Gulf context.

Data Extraction and Synthesis

Relevant data were extracted narratively and organized under key themes derived from repeated patterns across studies:

(1) Historical and current landscape of paramedicine;
(2) Emerging models of practice;
(3) Education, training, and regulation;
(4) Integration and system alignment; and
(5) Barriers and future opportunities.
Where possible, international comparisons were made to contextualize Saudi developments relative to global trends.

3. Results

The evolution of paramedicine in Saudi Arabia reflects a broader transformation in the country's healthcare delivery system, driven by the objectives of Vision 2030 and the Health Sector Transformation Program. The Saudi Red Crescent Authority (SRCA) has served as the cornerstone of prehospital care since its establishment in 1934, growing from a first aid and transport service into a national emergency network capable of providing advanced life support and critical prehospital interventions. Recent investments in technology, communication, and workforce training have enhanced service quality, with the introduction of computer-aided dispatch systems, GPS-based tracking, and digital performance monitoring. These developments have supported improvements in response times and coordination, particularly in major urban centres such as Riyadh, Jeddah, and Dammam. However, regional disparities persist, with rural and peripheral regions such as Jazan, Najran, and Al-Jouf facing shortages of trained paramedics and longer transport intervals to definitive care facilities. Figure 1 illustrates two complementary perspectives. The left panel presents a conceptual framework showing how Saudi paramedics interface with four interconnected domains—prehospital emergency response, hospital care, community and public health, and education and research—under the overarching Vision 2030 strategy. Arrows indicate bidirectional flows of data, feedback, and quality improvement, emphasizing integration and system learning. The right panel (timeline) outlines major milestones in paramedicine development in Saudi Arabia from 2000 to 2025, including the establishment of Bachelor of Emergency Medical Services (BEMS) programs, Saudi Commission for Health Specialties (SCFHS) professional classification, Vision 2030 reforms, and recent pilots in community paramedicine and tele-EMS. Together, these visuals demonstrate the profession's progressive evolution toward an evidence-driven, patient-centred, and preventive model of care.

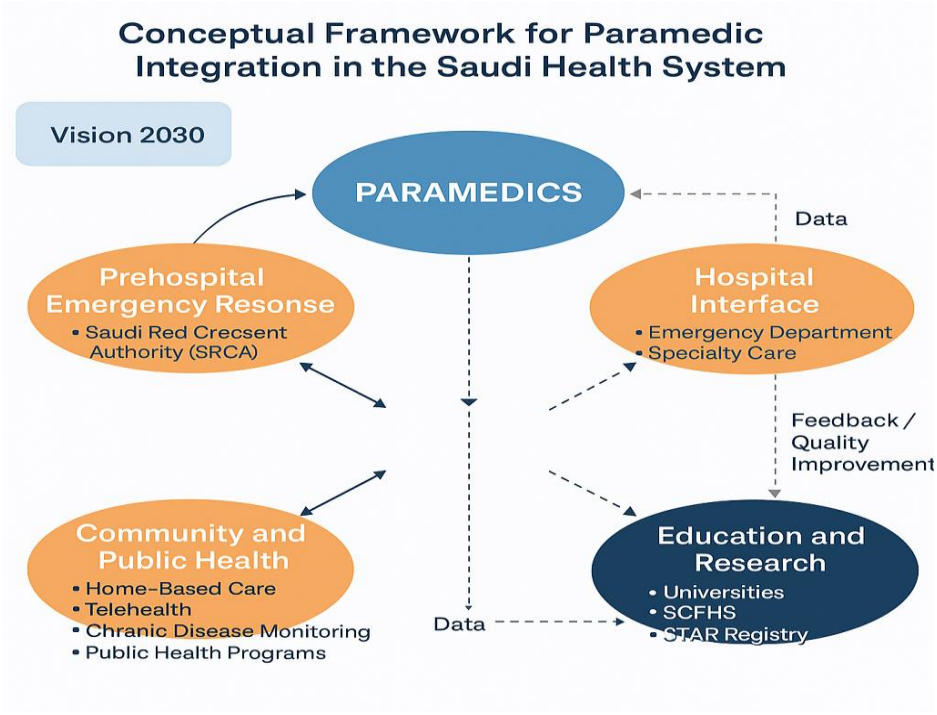

Figure 1. Conceptual framework for paramedic integration and development timeline in the Saudi health system.

Parallel to system modernization, the professionalization of the paramedic workforce has progressed rapidly. Over the past 15 years, universities across the Kingdom—including King Saud, Imam Abdulrahman bin Faisal, and Jazan—have launched bachelor's programs in emergency medical services (BEMS), marking a transition from technician-based practice toward professionalized, evidence-based clinical decision-making. The Saudi Commission for Health Specialties (SCFHS) has further reinforced this shift by formalizing licensure, introducing continuing education requirements, and developing career classification pathways. These advances have elevated the professional identity of paramedics and aligned Saudi EMS education with international standards. Yet, gaps remain in academic capacity, postgraduate training opportunities, and consistent national accreditation standards. The shortage of qualified educators, limited research capacity, and underrepresentation of female paramedics remain pressing challenges requiring systemic attention.

In recent years, there has been growing recognition of the need to expand the role of paramedics beyond traditional emergency response toward a more preventive, community-based, and integrated model of care. Globally, community paramedicine and mobile integrated healthcare (MIH) have demonstrated measurable benefits by reducing avoidable hospital transports, enhancing chronic disease management, and improving access for vulnerable populations. In Saudi Arabia, similar innovations are emerging through pilot initiatives led by the SRCA and Ministry of Health that deploy paramedics to provide home visits, follow-up care, and chronic condition monitoring—particularly in rural and underserved regions. These models align closely with national health priorities that emphasize preventive medicine, continuity of care, and efficient resource utilization. The experience of the COVID-19 pandemic further accelerated this transformation, as paramedics played central roles in tele-triage, vaccination, and home-monitoring programs. The success of these efforts illustrated the feasibility and public value of expanding the paramedic's scope toward community health and telemedicine-supported practice.

Despite encouraging progress, full implementation of such models remains limited by regulatory and structural constraints. Current laws and practice standards do not yet clearly define the paramedic's authority in non-emergency care, patient referral, or independent decision-making. Similarly, reimbursement mechanisms and interagency coordination between SRCA, Ministry of Health, and regional health clusters are underdeveloped. Without these structural enablers, expanded paramedic roles risk remaining fragmented or pilot-based rather than system-wide. Furthermore, while technology has advanced rapidly, integration between prehospital and hospital systems remains incomplete. Real-time data sharing, unified electronic health records, and standardized communication pathways are needed to ensure continuity of care and accurate documentation of patient outcomes.

The integration of paramedics within broader public health and primary care networks is another area of growing potential. Paramedics have demonstrated vital contributions to mass-gathering medicine and disaster preparedness, particularly during the annual Hajj and Umrah seasons, where they participate in large-scale triage, heat illness management, and public health surveillance. These experiences underscore the versatility and adaptability of the Saudi paramedic workforce. Nevertheless, the absence of national frameworks for role expansion, limited research on health outcomes, and insufficient public understanding of the paramedic's expertise continue to hinder the profession's full contribution. The societal perception of paramedics as "ambulance drivers" rather than autonomous clinicians remains a cultural challenge that requires active awareness and professional advocacy.

Several cross-cutting barriers continue to affect workforce sustainability and advancement. These include limited career progression pathways, lack of structured postgraduate education, uneven gender representation, and high occupational stress due to shift work and exposure to trauma. The unequal distribution of resources across regions also affects service equity, while the lack of unified national EMS databases restricts research, benchmarking, and policy evaluation. Addressing these issues requires policy reform that recognizes paramedics as integral healthcare professionals with defined clinical authority, supported by regulatory protection, educational investment, and interprofessional collaboration.

Overall, the findings of this review highlight a rapidly advancing but still maturing profession in Saudi

Arabia. Significant progress has been achieved in education, technology, and organizational development, yet further integration, recognition, and evidence-based reform are necessary to sustain this momentum. By capitalizing on global best practices in community paramedicine and mobile healthcare, and aligning with Vision 2030's goals for preventive, efficient, and patient-centred care, the Saudi paramedic workforce is well positioned to evolve into a central pillar of the national healthcare system. Comparison of international models illustrating how expanded paramedic roles improve healthcare accessibility and efficiency. The Saudi Vision 2030 Health Sector Transformation Program provides a supportive policy environment to adapt these models nationally (Table 1). Figures 2 illustrate the progressive transformation of paramedicine from traditional emergency response to integrated, community-based care models. The first conceptual diagram depicts the Saudi context under Vision 2030, showing the transition from ambulance-based emergency response toward preventive, patient-centred, and technology-enabled paramedicine. The second infographic summarizes international models including community paramedicine (Canada), mobile integrated healthcare (USA), extended care paramedics (Australia), and specialist paramedics in primary care (UK) highlighting their shared emphasis on home-based care, chronic disease management, and multidisciplinary collaboration. Together, these visuals demonstrate the global shift toward a more proactive and integrated role for paramedics and its relevance to Saudi Arabia's healthcare transformation.

Table 1. Summary of international models of paramedic role expansion and relevance to Saudi Arabia

Model / Country	Description of Role Expansion	Key Outcomes Reported	Implementation Challenges	Relevance to Saudi Arabia / Vision 2030 Alignment
Community Paramedicine (Canada)	Paramedics deliver home visits, chronic disease monitoring, medication reviews, and fall-prevention programs.	↓ Emergency department visits; improved continuity of care; better patient satisfaction.	Funding sustainability, variable provincial regulation.	Supports rural health access and preventive care goals in Vision 2030.
Mobile Integrated Healthcare (USA)	Paramedics integrated with physicians, nurses, and social workers for in-home acute and chronic care.	↓ Hospital readmissions, reduced 911 utilization, increased patient engagement.	Insurance reimbursement and cross-agency coordination.	Offers a model for Saudi health clusters seeking to optimize resource use.
Extended Care Paramedic (Australia)	Advanced paramedics assess, treat, and refer patients without hospital transport; some prescribe limited medications.	Up to 35% of patients managed safely in community settings; cost savings.	Training costs and professional resistance from other clinicians.	Could inform advanced practice paramedic development by SCFHS.
Specialist Paramedic in Primary Care (UK)	Paramedics embedded in general practice teams for home visits and urgent care triage.	↓ GP workload; improved access to urgent care in underserved areas.	Role ambiguity, funding, and integration with NHS structures.	Aligns with Saudi primary care reforms and "Healthy Communities" initiative.
Tele-paramedicine (Nordic Countries)	Use of teleconsultation for remote diagnostics, ECG transmission, and decision support.	Improved accuracy of triage, faster consultation with specialists.	Connectivity in rural areas and data-privacy laws.	Applicable to Saudi rural/remote EMS and ongoing digital transformation efforts.

Disaster & Mass-Gathering Paramedicine (Saudi Arabia)	Paramedics manage mass gatherings (e.g., Hajj) with triage, crowd health surveillance, and field stabilization.	Demonstrated efficiency in heat illness and trauma management; reduced hospital overload.	High seasonal demand, multilingual communication, logistics.	Provides local expertise that can be extended to national disaster preparedness and resilience.

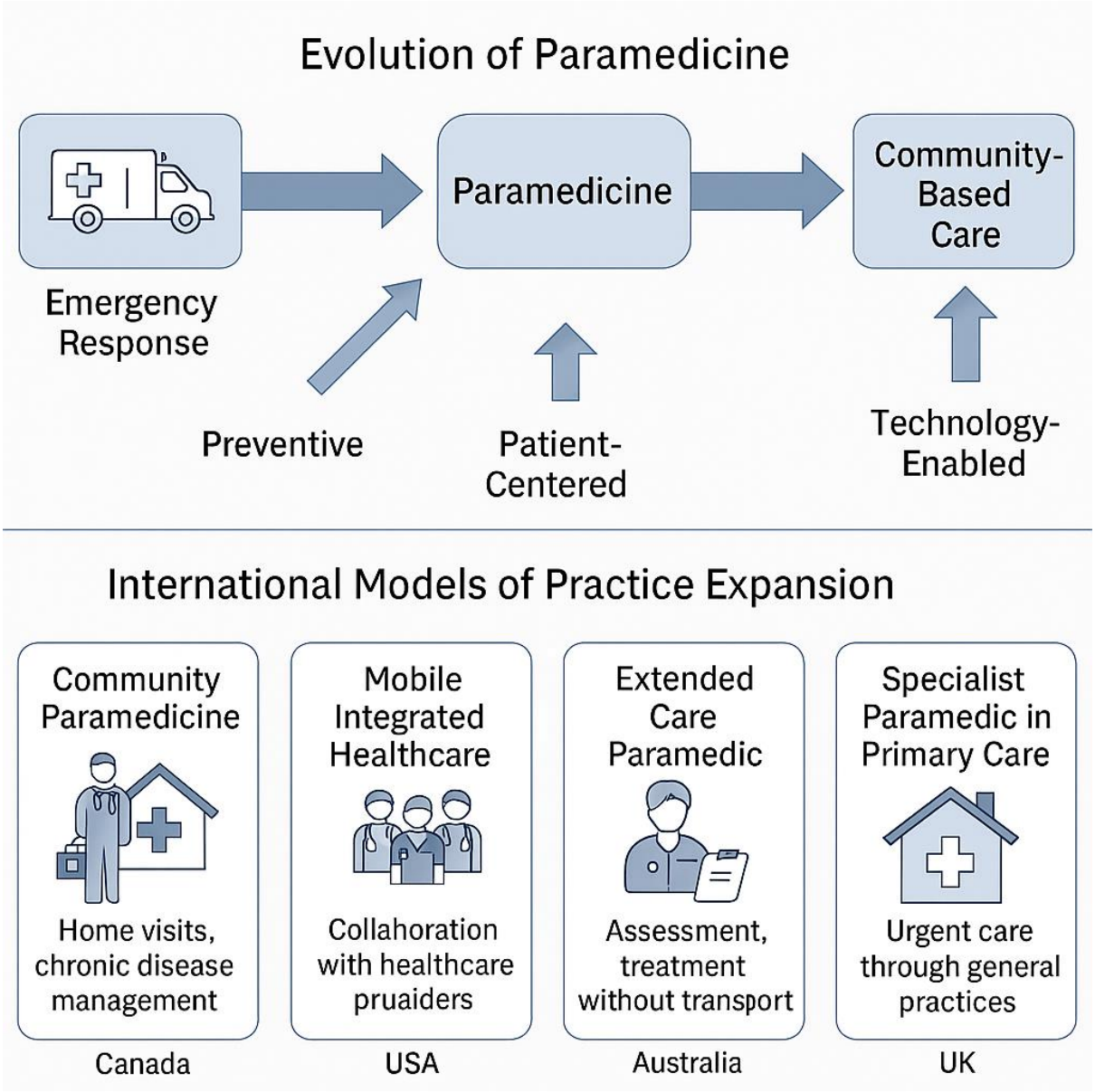

Figure 2. Conceptual overview of paramedic role evolution and international models of practice expansion.

4. Discussion

This review highlights the ongoing transformation of paramedicine in Saudi Arabia from a reactive emergency response service to an emerging, multifaceted healthcare profession aligned with the country's Vision 2030 goals. The findings demonstrate substantial progress in infrastructure, education, and workforce development; however, role expansion and system integration remain incomplete. The discussion below situates these findings within global trends, national reform priorities, and future opportunities for strengthening the paramedic profession.

Over the past two decades, paramedicine has undergone a paradigm shift internationally. In countries such as Canada, Australia, and the United Kingdom, paramedics have evolved into autonomous clinicians who deliver community-based, preventive, and integrative care across the health continuum (7-10). These models, particularly Community Paramedicine (CP) and Mobile Integrated Healthcare (MIH), extend the paramedic's role from responding to emergencies toward managing chronic diseases, conducting home visits, and coordinating with primary care and social services (11,12). Evidence from international studies demonstrates reductions in emergency department utilization, improved chronic condition outcomes, and enhanced patient satisfaction when paramedics are integrated into community health systems (13-15).

Saudi Arabia's current trajectory mirrors this evolution but remains at an earlier stage. The growing emphasis on preventive care, efficiency, and accessibility within the Health Sector Transformation Program provides a strong policy foundation for the adoption of such models. Pilot initiatives involving home visits, tele-triage, and chronic disease monitoring conducted by the SRCA and Ministry of Health during and after the COVID-19 pandemic show the feasibility and benefits of broader paramedic engagement (16-18). These efforts are particularly relevant in regions with limited healthcare infrastructure, where paramedics can bridge access gaps and contribute to equitable healthcare delivery.

Nonetheless, several barriers must be addressed before community-based paramedicine can be fully realized in the Saudi context. Regulatory frameworks remain largely focused on emergency transport and stabilization rather than preventive or chronic disease management (19). Paramedics currently lack formal authority to refer patients, initiate treatment protocols outside traditional emergency pathways, or engage in multidisciplinary care planning. The absence of structured reimbursement systems or recognition of paramedic-led services in insurance and health financing policies also limits program sustainability. These regulatory and financial constraints mirror the early challenges faced by other countries before adopting formal paramedic practice legislation (20-21).

Workforce development represents another critical area for reform. While the expansion of Bachelor of Emergency Medical Services programs has strengthened foundational training, the lack of postgraduate education, research pathways, and standardized national accreditation limits professional progression (22-24). In comparison, countries with mature paramedic professions have developed tiered career structures that include advanced practice, critical care, and specialist community paramedic roles. Saudi Arabia could benefit from adopting a similar competency-based framework supported by the Saudi Commission for Health Specialties, thereby creating clear advancement routes and fostering retention within the profession.

Cultural and social perceptions of paramedics also influence the profession's evolution. Despite improved public awareness following national campaigns and pandemic response efforts, misconceptions persist that paramedics are primarily ambulance drivers rather than skilled healthcare providers (25). Public education, professional advocacy, and visibility in academic and policy arenas are essential to improving professional identity and interprofessional collaboration. The involvement of paramedics in research, academic teaching, and quality improvement initiatives would further enhance recognition and integration within the broader health system (26).

Integration between EMS and hospital sectors remains a structural challenge but also presents a major opportunity for system improvement. Effective prehospital-to-hospital communication, data sharing, and electronic health record linkage can enhance patient outcomes, reduce duplication, and enable real-time quality monitoring. Establishing regional trauma and emergency care networks, as envisioned in the Saudi Vision 2030 Health Sector Transformation Program, provides a strategic platform for embedding paramedics within coordinated care pathways. These systems would allow data-driven evaluation of response times, clinical outcomes, and workforce performance, thereby informing continuous improvement and national benchmarking (27-30).

From a policy perspective, Saudi Arabia stands at a pivotal point where investment in paramedicine could yield substantial public health and economic benefits. Expanding the scope of paramedic practice aligns with Vision 2030's goals to enhance healthcare accessibility, efficiency, and value-based care. By

integrating paramedics into preventive and chronic disease management programs, the health system can alleviate pressure on emergency departments and hospitals, particularly as the burden of non-communicable diseases continues to rise. Moreover, empowering paramedics to operate in rural and underserved regions supports the broader national goal of reducing regional health disparities and promoting equitable service distribution.

Finally, advancing paramedicine requires building a stronger research and data infrastructure. National EMS registries—such as the Saudi TraumA Registry (STAR) and emerging digital reporting systems within SRCA—should be expanded to capture comprehensive patient, operational, and outcome data. This evidence base is crucial to guide workforce planning, measure the impact of new care models, and inform future policy decisions. Collaboration between academic institutions, healthcare clusters, and the SRCA will be essential to developing this research ecosystem.

In summary, Saudi Arabia has made commendable progress in modernizing EMS and elevating the status of paramedics as healthcare professionals. Yet, to fully realize the potential of paramedicine within a transformed health system, concerted action is needed across multiple domains—regulation, education, integration, and public perception. By adopting evidence-based models of community paramedicine, enhancing professional training, and embedding paramedics within national health reform strategies, the Kingdom can create a responsive, preventive, and patient-centred EMS system that contributes meaningfully to Vision 2030's health and quality-of-life objectives.

5. Conclusions

Paramedicine in Saudi Arabia is undergoing a pivotal transformation from a reactive emergency service to a proactive, integrated component of the national healthcare system. The profession has achieved remarkable progress in education, workforce development, and operational modernization under the leadership of the Saudi Red Crescent Authority and through alignment with Vision 2030's Health Sector Transformation Program. Yet, the evolution of paramedicine into a fully recognized clinical profession requires continued investment in regulatory reform, postgraduate education, and system integration.

Expanding the scope of paramedic practice beyond emergency response to include community-based care, chronic disease management, and preventive health initiatives will strengthen access, efficiency, and equity across the Kingdom—particularly in rural and underserved areas. Establishing clear practice frameworks, interprofessional collaboration mechanisms, and robust data systems will further enable paramedics to contribute to evidence-based care and national health goals.

Ultimately, empowering Saudi paramedics as autonomous, well-trained, and research-informed professionals will not only enhance emergency medical response but also position them as essential partners in achieving the Kingdom's vision of a high-quality, patient-centred, and resilient healthcare system.

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