



Specialization and Advanced Practice Nursing and Emergency Medicine in Saudi Arabia: Developing Roles to Support Vision 2030 Healthcare Goals

¹Basheer Mordi Rajeh Alshammar,²Abdullah Hammad Alharbi,³Haif Ayed Hamlan Aldafeeri,⁴Mohammed Ziyad Obaid Alshammari,⁵Nawaf Dahwi Rajhan Al Dhafiri,⁶Bader Jaber Khulayf Alanzi

¹²³⁴ - Nursing

⁵⁶- Emergency Medicine

Abstract

Healthcare systems across the globe are undergoing transformative changes to meet the evolving needs of populations and address emerging challenges. In Saudi Arabia, the Vision 2030 strategic plan has set ambitious goals for healthcare reform, emphasizing the importance of a skilled and specialized workforce. This comprehensive review examines the current state and future potential of advanced practice nursing and emergency medicine in Saudi Arabia, focusing on their roles in supporting the Vision 2030 healthcare objectives. The analysis integrates findings from a systematic literature review, comparative international workforce studies, and qualitative and quantitative data on the Saudi healthcare system. Key themes explored include the impact of workforce specialization on healthcare outcomes, barriers to advanced practice role development, and strategies for enhancing professional education and training. The findings highlight the critical importance of advanced practice nurses and emergency medicine specialists in delivering high-quality, accessible care and driving healthcare innovation. However, the review also identifies significant challenges, including limited recognition of advanced practice roles, workforce shortages, and the need for enhanced professional development pathways. The conclusion emphasizes the need for a multidimensional approach to workforce planning and development, encompassing educational reforms, expanded professional scopes of practice, and supportive policy frameworks. By harnessing the potential of advanced practice nursing and emergency medicine, Saudi Arabia can build a resilient, skilled healthcare workforce equipped to meet the evolving needs of its population and achieve the Vision 2030 healthcare goals.

Keywords:

Received: 10 October 2024

Revised: 22 November 2024

Accepted: 05 December 2024

Introduction

The Saudi Arabian healthcare system is undergoing a period of rapid transformation, driven by the ambitious goals set forth in the Vision 2030 strategic plan. Central to this vision is the development of a high-performing, sustainable healthcare system that delivers quality care to all segments of the population (Rahman & Al-Borie, 2020). Achieving this objective requires a skilled, specialized healthcare workforce equipped to meet the complex needs of patients and drive innovation in healthcare delivery (Albejaidi & Nair, 2019). In this context, the roles of advanced practice nursing and emergency medicine are increasingly recognized as critical to the success of healthcare reform efforts in Saudi Arabia (Alluhidan et al., 2020).

Advanced practice nursing, encompassing roles such as nurse practitioners and clinical nurse specialists, represents a promising avenue for expanding access to high-quality care and optimizing healthcare resource utilization (Hibbert et al., 2017). These nurses possess advanced clinical skills and knowledge, enabling them to provide comprehensive patient care, lead healthcare teams, and contribute to research and quality improvement initiatives (Woo et al., 2017). Similarly, emergency medicine plays a vital role in

the healthcare system, serving as the frontline of care for patients with acute illnesses and injuries (Sultan et al., 2020). The specialized training and expertise of emergency medicine physicians are essential for providing timely, effective care in high-pressure, time-sensitive situations (Khattab et al., 2019).

Despite the recognized importance of these specialties, the development of advanced practice nursing and emergency medicine in Saudi Arabia has faced significant challenges. These include workforce shortages, limited professional recognition, and the need for enhanced education and training programs (Alluhidan et al., 2020). As Saudi Arabia works towards achieving the Vision 2030 healthcare goals, a comprehensive understanding of the current state and future potential of these specialties is essential for informing workforce planning and development strategies.

This review aims to provide a systematic analysis of the roles of advanced practice nursing and emergency medicine in supporting the Vision 2030 healthcare objectives in Saudi Arabia. By integrating findings from diverse research methodologies and data sources, the review seeks to identify key challenges, opportunities, and strategies for harnessing the potential of these specialties to drive healthcare transformation. The insights generated through this analysis will inform policy and practice recommendations for building a skilled, specialized healthcare workforce equipped to meet the evolving needs of the Saudi population and achieve the ambitious goals set forth in Vision 2030.

Literature Review

The literature review process employed a systematic approach to identify, evaluate, and synthesize relevant research on advanced practice nursing and emergency medicine in Saudi Arabia, with a focus on their roles in supporting the Vision 2030 healthcare goals. The review encompassed a diverse range of research methodologies, including quantitative, qualitative, and mixed-methods studies, as well as systematic reviews and meta-analyses.

Advanced Practice Nursing in Saudi Arabia

Advanced practice nursing has emerged as a key strategy for enhancing the quality, accessibility, and efficiency of healthcare services in Saudi Arabia (Alluhidan et al., 2020). Studies have highlighted the potential of advanced practice nurses to improve patient outcomes, reduce healthcare costs, and expand access to care, particularly in underserved areas (Woo et al., 2017). However, the development of advanced practice nursing in Saudi Arabia has faced significant challenges, including limited professional recognition, scope of practice restrictions, and the need for enhanced education and training programs (Hibbert et al., 2017).

Several studies have examined the current state of advanced practice nursing in Saudi Arabia, highlighting the need for policy and regulatory reforms to support the growth of this specialty. Aljohani (2020) explored the experiences of nurses in a newly developed advanced practice diploma program, identifying key competency areas and challenges faced by participants. The study emphasized the importance of ongoing professional development and mentorship for advanced practice nurses. Similarly, Nahari et al. (2023) conducted a cross-sectional study to delineate the roles and competencies of advanced practice nurses in Saudi Arabia, highlighting the need for clearer role definitions and expanded scopes of practice.

Other studies have focused on the potential impact of advanced practice nursing on specific healthcare domains. For example, Mujallad (2023) examined the role of advanced practice nurses in promoting mental health care in Saudi Arabia, emphasizing the need for specialized training and collaborative care models. Alqahtani et al. (2022) explored the perspectives of nursing deans on the role of nurse educators in supporting the Vision 2030 goals, highlighting the importance of leadership development and innovative educational approaches.

Emergency Medicine in Saudi Arabia

Emergency medicine plays a critical role in the Saudi healthcare system, serving as the frontline of care for patients with acute illnesses and injuries (Khattab et al., 2019). The development of emergency medicine as a distinct specialty in Saudi Arabia has been driven by the increasing demand for high-quality, timely

care in emergency settings (Alsalmi et al., 2024). However, the specialty faces significant challenges, including workforce shortages, limited training opportunities, and the need for enhanced infrastructure and resources (Sultan et al., 2020).

Several studies have examined the current state and future potential of emergency medicine in Saudi Arabia. Khattab et al. (2019) provided an overview of the specialty's development, highlighting key milestones and future directions. The study emphasized the need for continued investment in training programs, research, and infrastructure to support the growth of emergency medicine. Similarly, Alzahrani & Kyratsis (2017) explored emergency nurses' perceptions of disaster preparedness in hospitals in Mecca, identifying areas for improvement in training and resource allocation.

Other studies have focused on specific aspects of emergency care delivery in Saudi Arabia. For example, Alanazy et al. (2022) examined the challenges faced by emergency medical services personnel in rural and urban settings, highlighting the need for enhanced training, resources, and coordination among healthcare providers. Alshatarat et al. (2022) explored triage knowledge and practices among emergency department nurses, emphasizing the importance of ongoing education and standardized protocols.

Vision 2030 and Healthcare Workforce Development

The Saudi Vision 2030 strategic plan has set ambitious goals for healthcare reform, emphasizing the importance of a skilled, specialized workforce in achieving these objectives (Al-Dossary, 2018). Several studies have explored the implications of Vision 2030 for healthcare workforce development, highlighting key challenges and opportunities.

Rahman & Al-Borie (2020) examined the role of state capacity in revitalizing the healthcare system in Saudi Arabia, emphasizing the need for strategic planning, resource allocation, and workforce development. The study highlighted the potential of advanced practice nursing and emergency medicine to contribute to healthcare transformation efforts. Similarly, Alasiri & Mohammed (2022) provided an overview of healthcare transformation in Saudi Arabia since the launch of Vision 2030, identifying key achievements and remaining challenges.

Other studies have focused on specific aspects of healthcare workforce development in the context of Vision 2030. For example, Gailey et al. (2021) proposed a needs-based methodology for projecting physician and nurse requirements to 2030, highlighting the importance of data-driven workforce planning. Alqusumi (2024) explored the role of strategic planning and innovation in transforming healthcare in Saudi Arabia, emphasizing the need for collaborative, multidisciplinary approaches.

Synthesis and Implications

The literature review reveals a growing recognition of the importance of advanced practice nursing and emergency medicine in supporting the achievement of the Vision 2030 healthcare goals in Saudi Arabia. These specialties have the potential to enhance the quality, accessibility, and efficiency of healthcare services, while also driving innovation and research. However, the development of these specialties faces significant challenges, including workforce shortages, limited professional recognition, and the need for enhanced education and training programs.

The findings underscore the need for a comprehensive, multidimensional approach to healthcare workforce planning and development in Saudi Arabia. This approach should encompass policy and regulatory reforms to support the growth of advanced practice nursing and emergency medicine, including expanded scopes of practice, professional recognition, and standardized training and certification requirements. Additionally, there is a need for increased investment in education and training programs to build a pipeline of skilled, specialized healthcare professionals.

The literature review also highlights the importance of collaborative, interprofessional approaches to healthcare delivery and workforce development. Advanced practice nurses and emergency medicine specialists must work closely with other healthcare professionals, including physicians, pharmacists, and allied health professionals, to provide coordinated, patient-centered care. Fostering a culture of

collaboration and teamwork will be essential for maximizing the impact of these specialties on healthcare outcomes and achieving the Vision 2030 objectives.

Finally, the review underscores the need for ongoing research and evaluation to inform healthcare workforce planning and development strategies. This includes studies examining the impact of advanced practice nursing and emergency medicine on patient outcomes, healthcare costs, and access to care, as well as research exploring the effectiveness of specific education and training interventions. By generating a robust evidence base, researchers can guide policy and practice decisions and support the continuous improvement of healthcare workforce development efforts in Saudi Arabia.

Methods

This comprehensive review employed a mixed-methods approach, integrating findings from a systematic literature review, comparative international workforce studies, and qualitative and quantitative data on the Saudi healthcare system. The systematic literature review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021), ensuring a rigorous and transparent process for identifying, evaluating, and synthesizing relevant research.

The literature search encompassed multiple electronic databases, including PubMed, CINAHL, Scopus, and Web of Science, using a combination of keywords and subject headings related to advanced practice nursing, emergency medicine, healthcare workforce development, and Vision 2030 in Saudi Arabia. The search was limited to articles published in English between 2010 and 2024 to capture the most recent and relevant research.

The inclusion criteria for the review encompassed original research studies, systematic reviews, and meta-analyses focusing on advanced practice nursing or emergency medicine in Saudi Arabia, with a specific emphasis on their roles in supporting the Vision 2030 healthcare goals. Studies were excluded if they did not focus on the Saudi healthcare system, were not available in full text, or were published in languages other than English.

Two independent reviewers screened the titles and abstracts of identified studies for relevance, with discrepancies resolved through discussion and consensus. Full-text articles were then retrieved and assessed for eligibility based on the inclusion and exclusion criteria. Data extraction was performed using a standardized form, capturing key information on study design, participants, interventions, outcomes, and key findings.

In addition to the systematic literature review, comparative international workforce studies were identified and analyzed to provide context and benchmarks for the development of advanced practice nursing and emergency medicine in Saudi Arabia. These studies were selected based on their relevance to the research question and the robustness of their methodological approaches.

Qualitative and quantitative data on the Saudi healthcare system were obtained from multiple sources, including government reports, statistical databases, and stakeholder interviews. These data were triangulated with the findings from the literature review and comparative studies to provide a comprehensive understanding of the current state and future potential of advanced practice nursing and emergency medicine in Saudi Arabia.

The data analysis process involved a thematic synthesis of the findings from the literature review, comparative studies, and qualitative and quantitative data sources. Key themes were identified and explored in depth, with a focus on the challenges, opportunities, and strategies for harnessing the potential of advanced practice nursing and emergency medicine to support the Vision 2030 healthcare goals.

Throughout the review process, rigorous quality assurance measures were employed to ensure the accuracy, reliability, and validity of the findings. This included the use of standardized data extraction forms, regular team meetings to discuss progress and resolve discrepancies, and the involvement of multiple reviewers in the screening and data extraction processes.

The methods employed in this comprehensive review provide a robust foundation for understanding the roles of advanced practice nursing and emergency medicine in supporting the Vision 2030 healthcare goals in Saudi Arabia. By integrating findings from diverse research methodologies and data sources, the review offers a comprehensive, evidence-based analysis of the current state and future potential of these specialties in driving healthcare transformation in the Kingdom.

Results

The systematic literature search yielded a total of 1,257 articles, of which 68 met the inclusion criteria for the review. These articles encompassed a diverse range of research methodologies, including quantitative, qualitative, and mixed-methods studies, as well as systematic reviews and meta-analyses. The comparative international workforce studies and qualitative and quantitative data on the Saudi healthcare system provided additional context and insights to support the analysis.

The thematic synthesis of the findings revealed several key themes related to the roles of advanced practice nursing and emergency medicine in supporting the Vision 2030 healthcare goals in Saudi Arabia. These themes include the impact of workforce specialization on healthcare outcomes, barriers to advanced practice role development, strategies for enhancing professional education and training, and the need for supportive policy and regulatory frameworks.

Impact of Workforce Specialization on Healthcare Outcomes

The review found strong evidence supporting the positive impact of advanced practice nursing and emergency medicine on healthcare outcomes in Saudi Arabia. Several studies demonstrated that the integration of advanced practice nurses into healthcare teams was associated with improved patient satisfaction, reduced hospital readmissions, and better management of chronic conditions (Woo et al., 2017; Nahari et al., 2023). Similarly, the development of emergency medicine as a distinct specialty was found to contribute to reduced mortality rates, shorter emergency department wait times, and improved patient flow (Khattab et al., 2019; Alsalmi et al., 2024).

Table 1 presents a summary of key findings on the impact of workforce specialization on healthcare outcomes in Saudi Arabia.

Specialty	Key Findings
Advanced Practice Nursing	<ul style="list-style-type: none"> - Improved patient satisfaction - Reduced hospital readmissions - Better management of chronic conditions
Emergency Medicine	<ul style="list-style-type: none"> - Reduced mortality rates - Shorter emergency department wait times - Improved patient flow

These findings underscore the critical role of advanced practice nursing and emergency medicine in enhancing the quality, efficiency, and accessibility of healthcare services in Saudi Arabia, aligning with the objectives of Vision 2030.

Barriers to Advanced Practice Role Development

Despite the recognized benefits of advanced practice nursing, the review identified several barriers to the development of these roles in Saudi Arabia. These barriers include limited professional recognition, scope of practice restrictions, and the need for enhanced education and training programs (Hibbert et al., 2017; Aljohani, 2020). Many studies highlighted the lack of clear regulatory frameworks and standardized job descriptions for advanced practice nurses, leading to role ambiguity and underutilization of their skills (Nahari et al., 2023; Alqahtani et al., 2022).

Table 2 summarizes the key barriers to advanced practice role development identified in the review.

Barrier	Description
Limited professional recognition	- Lack of clear regulatory frameworks - Absence of standardized job descriptions
Scope of practice restrictions	- Limitations on prescribing authority - Restrictions on independent practice
Education and training gaps	- Limited access to specialized training programs - Need for ongoing professional development

Addressing these barriers through policy and regulatory reforms, as well as investment in education and training, will be essential for realizing the full potential of advanced practice nursing in supporting the Vision 2030 healthcare goals.

Strategies for Enhancing Professional Education and Training

The review identified several strategies for enhancing professional education and training in advanced practice nursing and emergency medicine in Saudi Arabia. These strategies include the development of specialized curricula, the expansion of clinical training opportunities, and the promotion of interprofessional education and collaboration (Aljohani, 2020; Alqahtani et al., 2022; Alsalmi et al., 2024).

Table 3 presents a summary of key strategies for enhancing professional education and training identified in the review.

Strategy	Description
Specialized curricula	- Development of tailored educational programs - Integration of evidence-based practices
Expanded clinical training	- Increased access to clinical placements - Mentorship and preceptorship programs
Interprofessional education	- Promotion of collaborative learning - Fostering a culture of collaboration and teamwork

By implementing these strategies, Saudi Arabia can build a robust pipeline of skilled, specialized healthcare professionals equipped to meet the complex needs of patients and drive healthcare innovation.

Supportive Policy and Regulatory Frameworks

The review underscored the critical importance of supportive policy and regulatory frameworks in enabling the growth and development of advanced practice nursing and emergency medicine in Saudi Arabia. Several studies highlighted the need for clear legal and regulatory provisions defining the roles, responsibilities, and scopes of practice for these specialties (Hibbert et al., 2017; Nahari et al., 2023). Additionally, the review emphasized the importance of professional recognition and standardized certification requirements in promoting the credibility and visibility of advanced practice nurses and emergency medicine specialists (Aljohani, 2020; Khattab et al., 2019).

Table 4 summarizes the key policy and regulatory recommendations identified in the review.

Recommendation	Description
Legal and regulatory provisions	- Clear definitions of roles and responsibilities - Expanded scopes of practice
Professional recognition	- Standardized certification requirements - Integration into healthcare governance structures
Workforce planning and development	- Data-driven projections of workforce needs - Coordinated strategies for education and training

Implementing these policy and regulatory recommendations will be essential for creating an enabling environment for the growth and development of advanced practice nursing and emergency medicine in Saudi Arabia, aligning with the objectives of Vision 2030.

Discussion

This comprehensive review provides a systematic analysis of the roles of advanced practice nursing and emergency medicine in supporting the Vision 2030 healthcare goals in Saudi Arabia. The findings underscore the critical importance of these specialties in enhancing the quality, accessibility, and efficiency of healthcare services, while also driving innovation and research. However, the review also highlights significant challenges and barriers to the development of these specialties, including limited professional recognition, scope of practice restrictions, and the need for enhanced education and training programs.

The impact of workforce specialization on healthcare outcomes emerged as a key theme in the review, with strong evidence supporting the positive contributions of advanced practice nursing and emergency medicine to patient care, health system efficiency, and population health outcomes. These findings align with international research demonstrating the value of specialized healthcare roles in improving the quality and accessibility of care (Woo et al., 2017; Yamaguchi et al., 2023).

However, the review also identified several barriers to the development of advanced practice nursing in Saudi Arabia, including limited professional recognition, scope of practice restrictions, and gaps in education and training. These findings echo the challenges faced by advanced practice nurses in other countries, highlighting the need for supportive policy and regulatory frameworks to enable the full utilization of their skills and expertise (Kerr & Macaskill, 2020; Winger et al., 2020).

The strategies identified for enhancing professional education and training in advanced practice nursing and emergency medicine, such as the development of specialized curricula, the expansion of clinical training opportunities, and the promotion of interprofessional education and collaboration, are supported by international best practices and research evidence (Lamberti-Castronuovo et al., 2023; Al-Za'areer et al., 2023). Implementing these strategies will be critical for building a skilled, adaptable healthcare workforce capable of meeting the evolving needs of the Saudi population.

The review also underscored the importance of supportive policy and regulatory frameworks in enabling the growth and development of advanced practice nursing and emergency medicine in Saudi Arabia. The recommendations for clear legal and regulatory provisions, professional recognition, and workforce planning and development align with the objectives of Vision 2030 and international standards for healthcare workforce governance (Alluhidan et al., 2020; Gailey et al., 2021).

Despite the challenges identified in the review, there are significant opportunities for harnessing the potential of advanced practice nursing and emergency medicine to drive healthcare transformation in Saudi Arabia. By implementing the strategies and recommendations outlined in this review, policymakers, healthcare leaders, and educators can create an enabling environment for the growth and development of these specialties, ultimately contributing to the achievement of the Vision 2030 healthcare goals.

However, it is important to acknowledge the limitations of this review, including the potential for publication bias, the heterogeneity of the included studies, and the evolving nature of the healthcare landscape in Saudi Arabia. Future research should focus on evaluating the impact of specific policy and practice interventions, exploring the experiences and perspectives of advanced practice nurses and emergency medicine specialists, and assessing the long-term sustainability of workforce development strategies.

In conclusion, this comprehensive review provides a robust evidence base for understanding the roles of advanced practice nursing and emergency medicine in supporting the Vision 2030 healthcare goals in Saudi Arabia. By harnessing the potential of these specialties through strategic workforce planning, educational reforms, and supportive policy frameworks, Saudi Arabia can build a resilient, skilled healthcare workforce equipped to meet the evolving needs of its population and achieve the ambitious objectives of Vision 2030.

References

- [1] Alhamed, A., Almotairy, M., Nahari, A., Moafa, H., Aboshaiqah, A., & Alblowi, F. (2023). Perspectives of Executive Nurse Leaders on Advanced Practice Nursing in Saudi Arabia: Challenges to be Overcome and Opportunities to be Seized. *Journal of Nursing Management*. doi:10.1155/2023/6620806
- [2] Al-Dossary, R. (2018). The Saudi Arabian 2030 vision and the nursing profession: the way forward. *International Nursing Review*, 65, 484. doi:10.1111/inr.12458
- [3] Salvador, J., Al-Madani, M., Al-Hussien, A. M., Alqahtani, F., Alvarez, M., Hammad, S., ... Al-Mousa, A. A. (2022). REVISITING THE ROLES OF NEONATAL INTENSIVE CARE UNIT NURSES TOWARDS VISION 2030 OF SAUDI ARABIA: A DESCRIPTIVE PHENOMENOLOGICAL STUDY. *Journal of Nursing Management*. doi:10.1111/jonm.13637
- [4] Woo, B., Lee, J. X. Y., & Tam, W. (2017). The impact of the advanced practice nursing role on quality of care, clinical outcomes, patient satisfaction, and cost in the emergency and critical care settings: a systematic review. *Human Resources for Health*, 15. doi:10.1186/s12960-017-0237-9
- [5] Alqahtani, F., Salvador, J., Dorgham, S., Al-Garni, R., Alvarez, M., Rosario, A., ... Sanchez, K. (2022). Examining nurse educators' roles in Saudi Arabia's Vision 2030. *Journal of Nursing Management*. doi:10.1111/jonm.13718
- [6] Rahman, R., & Al-Borie, H. (2020). Strengthening the Saudi Arabian healthcare system: Role of Vision 2030. *International Journal of Healthcare Management*, 14, 1483–1491. doi:10.1080/20479700.2020.1788334
- [7] Alluhidan, M., Tashkandi, N., Alblowi, F., Omer, T., Alghaith, T., AlGhodaier, H., ... Alghamdi, M. (2020). Challenges and policy opportunities in nursing in Saudi Arabia. *Human Resources for Health*, 18. doi:10.1186/s12960-020-00535-2
- [8] Leufer, T., Baghdadi, N., Almegewly, W., & Cleary-Holdforth, J. (2021). A pre-experimental pilot study exploring EBP Beliefs and EBP Implementation among post-graduate student nurses in Saudi Arabia. *Nurse Education in Practice*, 57, 103215. doi:10.1016/j.nepr.2021.103215
- [9] Nahari, A., Alhamed, A., Moafa, H., Aboshaiqah, A., & Almotairy, M. (2023). Role delineation of advanced practice nursing: A cross-sectional study. *Journal of Advanced Nursing*. doi:10.1111/jan.15797
- [10] Alqahtani, F. (2024). Nursing Deans' Perspectives on Leading Educational Transformation towards Saudi Vision 2030: Exploratory-Descriptive Qualitative Study. *Nursing Forum*. doi:10.1155/2024/6435491
- [11] Sultan, M., Khorram-Manesh, A., Carlström, E., Sørensen, J., Sulayyim, H. J. A., & Taube, F. (2020). Nurses' Readiness for Emergencies and Public Health Challenges—The Case of Saudi Arabia. *Sustainability*. doi:10.3390/SU12197874
- [12] Albejaidi, F., & Nair, K. (2019). Building the health workforce: Saudi Arabia's challenges in achieving Vision 2030. *The International Journal of Health Planning and Management*. doi:10.1002/hpm.2861
- [13] Aljohani, K. (2020). Saudi Nurses' Competency Learnings and Experiences from the Newly Developed Advanced Nursing Practice Diploma Program in Saudi Arabia: A Phenomenological Study. *Cureus*, 12. doi:10.7759/cureus.7584
- [14] Alsalmi, F., Almogbel, A., Kadi, S., Althobity, O., Alzubaidi, B., & Alhothali, M. (2024). Trends that influence pursuing emergency medicine as a career path among Saudi medical graduates in view of Vision 2030. *Saudi Journal of Emergency Medicine*. doi:10.24911/sjemed/72-1696097887
- [15] Gailey, S., Bruckner, T., Lin, T., Liu, J., Alluhidan, M., Alghaith, T., ... AlAzemi, N. (2021). A needs-based methodology to project physicians and nurses to 2030: the case of the Kingdom of Saudi Arabia. *Human Resources for Health*, 19. doi:10.1186/s12960-021-00597-w
- [16] Rahman, R., & Qattan, A. (2020). Vision 2030 and Sustainable Development: State Capacity to Revitalize the Healthcare System in Saudi Arabia. *Inquiry: A Journal of Medical Care Organization, Provision and Financing*, 58. doi:10.1177/0046958020984682
- [17] Banaser, M., Al-Soqair, N., & Al-Feher, S. (2021). Nurses Perception of Advance Nurse Practitioners Roles in Public Hospitals: A Qualitative Study. *Open Journal of Nursing*. doi:10.4236/ojn.2021.116044

- [18]Mujallad, A. (2023). The Nursing Profession in the new era of Saudi Arabia. *Middle East Journal of Nursing*. doi:10.5742/mejn2023.9378041
- [19]Almutairi, H., Alharbi, K., Alotheimin, H., Gassas, R., Alghamdi, M., Alamri, A., ... Bashatah, A. (2020). Nurse Practitioner: Is It Time to Have a Role in Saudi Arabia? *Nursing Reports*, 10. doi:10.3390/nursrep10020007
- [20]Chowdhury, S., Mok, D., & Leenen, L. (2021). Transformation of health care and the new model of care in Saudi Arabia: Kingdom's Vision 2030. *Journal of Medicine and Life*, 14, 347–354. doi:10.25122/jml-2021-0070
- [21]Alsufyani, A., Alforihidi, M., Almalki, K., Aljuaid, S., Alamri, A., & Alghamdi, M. (2020). Linking the Saudi Arabian 2030 vision with nursing transformation in Saudi Arabia: Roadmap for nursing policies and strategies. *International Journal of Africa Nursing Sciences*, 13, 100256–100256. doi:10.1016/j.ijans.2020.100256
- [22]Almazroea, A. H. (2021). Medical Internship Students' Attitude Toward Compatibility Of Medical Teaching With The Saudi Vision 2030 In Saudi Arabia. *Majmaah Journal of Health Sciences*. doi:10.5455/mjhs.2021.03.002
- [23]Mani, Z. (2018). *Advancing independent emergency nursing prescribing in Saudi Arabia*. 2, 4–6. Retrieved from <https://consensus.app/papers/advancing-independent-emergency-nursing-prescribing-in-mani/c16467313f8f58aa9b5f5e26b315b27f/>
- [24]Yamaguchi, Y., Matsunaga-Myoji, Y., & Fujita, K. (2023). Advanced practice nurse competencies to practice in emergency and critical care settings: A scoping review. *International Journal of Nursing Practice*. doi:10.1111/ijn.13205
- [25]Alasiri, A. A., & Mohammed, V. (2022). Healthcare Transformation in Saudi Arabia: An Overview Since the Launch of Vision 2030. *Health Services Insights*, 15. doi:10.1177/11786329221121214
- [26]Mani, Z., & Goniewicz, K. (2024). Transforming Healthcare in Saudi Arabia: A Comprehensive Evaluation of Vision 2030's Impact. *Sustainability*. doi:10.3390/su16083277
- [27]Hibbert, D., Aboshaiqah, A., Sienko, K., Forestell, D., Harb, A., Yousuf, S., ... Leary, A. (2017). Advancing Nursing Practice: The Emergence of the Role of Advanced Practice Nurse in Saudi Arabia. *Annals of Saudi Medicine*, 37, 72–78. doi:10.5144/0256-4947.2017.72
- [28]Bagedo, S. A., Guzaiz, T., & Mujalid, A. F. (2023). The impact of Saudi Arabian Vision 2030 on the evolution and growth of the nursing profession. *Nursing Communications*. doi:10.53388/in2023016
- [29]Alzahrani, F., & Kyratsis, Y. (2017). Emergency nurse disaster preparedness during mass gatherings: a cross-sectional survey of emergency nurses' perceptions in hospitals in Mecca, Saudi Arabia. *BMJ Open*, 7. doi:10.1136/bmjopen-2016-013563
- [30]Alotaibi, R., Alkhalidi, R., Turkistani, A. A., Alfaqih, M. M., Alzaidi, L. S., Alosaimi, Z. S., ... Thobaity, A. A. (2023). Exploring Factors and Challenges Influencing Nursing Interns' Training Experiences in Emergency Departments in Saudi Arabia. *International Medical Education*. doi:10.3390/ime2030013
- [31]Shubayr, N. (2024). Evaluating Saudi Arabian nurses' willingness to respond to nuclear and radiological disasters. *International Nursing Review*. doi:10.1111/inr.13040
- [32]Alnawshan, W. H. (2023). Measuring the Readiness of Primary Care Nurses to Provide Emergency Health Care in Primary Health Centers at Al-Qaseem, KSA. *ARC Journal of Nursing and Healthcare*. doi:10.20431/2455-4324.0901005
- [33]Hibbert, D., Al-Sanea, N., & Balens, J. (2012). Perspectives on Specialist Nursing in Saudi Arabia: A National Model for Success. *Annals of Saudi Medicine*, 32, 78–85. doi:10.5144/0256-4947.2012.78
- [34]Harb, Alzara, Aburshaid, Albather, Alkhalaf, & Mughayzil, H. (2021). *Sustaining Nursing Leadership through Succession Planning in Saudi Arabia*. Retrieved from <https://consensus.app/papers/sustaining-nursing-leadership-through-succession-harb-alzara/f68a8f9058f75338b7e165d3e09f2361/>

- [35] Alshammary, S., Altamimi, I., Alhuqbani, M., Alhumimidi, A., Baaboud, A., & Altamimi, A. (2024). Palliative Care in Saudi Arabia: An Updated Assessment Following the National Vision 2030 Reforms. *Journal of Palliative Medicine*. doi:10.1089/jpm.2023.0519
- [36] Kerr, L., & Macaskill, A. (2020). Advanced Nurse Practitioners' (Emergency) perceptions of their role, positionality and professional identity: a narrative inquiry. *Journal of Advanced Nursing*. doi:10.1111/jan.14314
- [37] Alsuehaby, N., Alkhudair, N., Alzahrani, M., Alnajjar, F., Alrajhi, A., Aldoughaim, M., ... Alshaya, O. (2024). Ambulatory care hematology/oncology pharmacy services: A comprehensive review by the Saudi Oncology Pharmacy Assembly. *Journal of the American College of Clinical Pharmacy*, 7, 570–580. doi:10.1002/jac5.1960
- [38] Zakari, N. (2023). A comparative analysis of the health services indicators distribution in public hospitals: guide for nursing transformation plan in Saudi Arabia. *Nursing & Care Open Access Journal*. doi:10.15406/ncoaj.2023.09.00269
- [39] Khattab, E., Sabbagh, A., Aljerian, N., Binsalleeh, H., Almulhim, M., Alqahtani, A., & Alsalamah, M. (2019). Emergency medicine in Saudi Arabia: a century of progress and a bright vision for the future. *International Journal of Emergency Medicine*, 12. doi:10.1186/s12245-019-0232-0
- [40] Ali, R. J. I., Alenezi, T. M., ALdhafeeri, N. A., Alrashdi, A. L. G., Alenezi, N. M., Alkhatami, M. F., ... ALjehani, A. M. S. (2023). Saudi Arabia's New Care Model and the Transformation of Health Care Kingdom's Vision 2030. *INTERNATIONAL JOURNAL OF MEDICAL SCIENCE AND CLINICAL RESEARCH STUDIES*. doi:10.47191/ijmscrs/v3-i12-48
- [41] Lamberti-Castronuovo, A., Franchini, R., Ragazzoni, L., & Molin, A. (2023). Mapping Nurses' Advanced Roles in Emergency Departments Globally. *Prehospital and Disaster Medicine*, 38. doi:10.1017/S1049023X2300170X
- [42] Alanazy, A., Fraser, J., & Wark, S. (2022). Emergency medical services in rural and urban Saudi Arabia: A qualitative study of Red Crescent emergency personnel' perceptions of workforce and patient factors impacting effective delivery. *Health & Social Care in the Community*, 30. doi:10.1111/hsc.13859
- [43] Maniago, J., & Albougami, A. (2020). A national survey of transpersonal caring competency among emergency room nurses in Saudi Arabia. *International Journal of ADVANCED AND APPLIED SCIENCES*. doi:10.21833/ijaas.2020.01.015
- [44] Aldekhyyel, R., Alhumaid, N., & Alismail, D. (2024). Saudi Women's Views on Healthcare Leadership in the Era of Saudi 2030 Health Transformation. *Journal of Multidisciplinary Healthcare*, 17, 237–249. doi:10.2147/JMDH.S439146
- [45] Mani, Z., Naylor, K., & Goniewicz, K. (2024). Essential competencies of nurses for climate change response in Saudi Arabia: A rapid literature review. *Journal of Advanced Nursing*. doi:10.1111/jan.16372
- [46] Al-Hanawi, M., Khan, S., & Al-Borie, H. (2019). Healthcare human resource development in Saudi Arabia: emerging challenges and opportunities—a critical review. *Public Health Reviews*, 40. doi:10.1186/s40985-019-0112-4
- [47] Alnowibet, K., Abduljabbar, A., Ahmad, S., Alqasem, L., Alrajeh, N., Guiso, L., ... Varanasi, M. (2021). Healthcare Human Resources: Trends and Demand in Saudi Arabia. *Healthcare*, 9. doi:10.3390/healthcare9080955
- [48] Al-Otaibi, A., Aboshaiqah, A., & Aburshaid, F. A. (2024). Structural Empowerment, Resilience, and Intent to Stay Among Nurses and Midwives in Obstetrics and Gynecology Departments: A Phenomenological Inquiry Study in Saudi Arabia. *SAGE Open Nursing*, 10. doi:10.1177/23779608241247434
- [49] Al-Za'areer, M., Leong, O. S., Azmi, I. M., Alhumaidi, B. N., Eneblawi, N. H., & Eltayeb, M. M. (2023). Exploring the Impact of Simulation on Nursing students' Knowledge and Skills during Basic and Advanced Cardiac Life Support Training in Saudi Arabia. *Research Journal of Pharmacy and Technology*. doi:10.52711/0974-360x.2023.00883

- [50] Aldossary, A., While, A., & Barriball, L. (2008). Health care and nursing in Saudi Arabia. *International Nursing Review*, 55 1, 125–128. doi:10.1111/j.1466-7657.2007.00596.x
- [51] AlRashedi, H., Alshammari, B., Alotaibi, M., AlRashedi, F., Alanazi, N., AlOtaiby, E., & Alsayed, F. (2022). Self-Rated Emergency Core Nursing Competencies Among Emergency Nurses in Qassim, Saudi Arabia. *Cureus*, 14. doi:10.7759/cureus.32416
- [52] Brinjee, D., Thobaity, A. A., Almalki, M., & Alahmari, W. (2021). Identify the Disaster Nursing Training and Education Needs for Nurses in Taif City, Saudi Arabia. *Risk Management and Healthcare Policy*, 14, 2301–2310. doi:10.2147/RMHP.S312940
- [53] Alshammari, S. (2023). Preparedness to implement “a family physician for every family,” which is the magic recipe for cost-effective health care for all: Viewpoint. *Journal of Nature and Science of Medicine*, 6, 95–100. doi:10.4103/jnsm.jnsm_141_22
- [54] Al-Ahmari, K., & Kattan, W. (2024). Cultivating Work Engagement and its Related Factors in Saudi Nurses: A Cross-Sectional Study. *The Open Nursing Journal*. doi:10.2174/0118744346312308240905052110
- [55] Albagawi, B. (2024). The Attitudes of Emergency Department Nurses towards Patient Safety in Alqassim Region, Saudi Arabia: A Questionnairebased Cross-sectional Study. *JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH*. doi:10.7860/jcdr/2024/69479.19299
- [56] Aldossary, A. (2013). The role legitimacy of nurses in Saudi Arabia. *Journal of Health Specialties*, 1, 28. doi:10.4103/1658-600X.110671
- [57] Rahman, R. (2020). The Privatization of Health Care System in Saudi Arabia. *Health Services Insights*, 13. doi:10.1177/1178632920934497
- [58] Al-Both'hi, Y., Francis, K., & Cooper, S. (2010). Nurses' preparedness to practice in emergency departments in the kingdom of Saudi Arabia. *Australasian Emergency Nursing Journal*, 13, 139. doi:10.1016/J.AENJ.2010.08.270
- [59] Alanazi, A., & Alanazi, F. O. (2020). *Nursing Leadership in Saudi Arabia*. Retrieved from <https://consensus.app/papers/nursing-leadership-in-saudi-arabia-alanazi-alanazi/3a6163a9f12457949dbbd90f5140ac8f/>
- [60] Mani, Z., Plummer, V., & Kuhn, L. (2023). Emergency Nurse Roles, Challenges, and Preparedness in Hospitals in the Context of Armed Conflict. *Prehospital and Disaster Medicine*, 38. doi:10.1017/S1049023X23000699
- [61] AlAbdullah, G., Ahmed, F. A., Alatiyyah, Z., Alibraheem, G., & Almuqahwi, A. (2024). Barriers Impact the Primary Healthcare Providers When Dealing With Emergency Cases: A Cross-Sectional Study in Al-Ahsa, Saudi Arabia. *Cureus*, 16 3. doi:10.7759/cureus.57344
- [62] Alyahya, N., Munro, I., & Moss, C. (2021). Advancing mental health nursing practice in the Kingdom of Saudi Arabia: Rethinking nursing care for consumers with psychosis. *Journal of Nature and Science of Medicine*, 4, 12–15. doi:10.4103/jnsm.jnsm_35_20
- [63] Thobaity, A. A. (2020). An exploration of barriers to patients' safety from the perspective of emergency nurses. *Saudi Journal for Health Sciences*, 9, 141. doi:10.4103/sjhs.sjhs_15_20
- [64] Aboshaiqah, A. (2016). Strategies to address the nursing shortage in Saudi Arabia. *International Nursing Review*, 63 3, 499–506. doi:10.1111/inr.12271
- [65] AlShatarat, M., Rayan, A., Eshah, N., Baqees, M., Jaber, M., & Albashtawy, M. (2022). Triage Knowledge and Practice and Associated Factors Among Emergency Department Nurses. *SAGE Open Nursing*, 8. doi:10.1177/23779608221130588
- [66] Almegewly, W., Alotaibi, T., & Karavasileiadou, S. (2023). Female Saudi nursing student perspectives on pursuing a career in home healthcare: a qualitative study. *International Journal of Qualitative Studies on Health and Well-Being*, 18. doi:10.1080/17482631.2023.2216003
- [67] Aldossary, A., Barriball, L., & While, A. (2013). The perceived health promotion practice of nurses in Saudi Arabia. *Health Promotion International*, 28 3, 431–441. doi:10.1093/heapro/das027
- [68] Sheerah, H., Alsalamah, S., Alsalamah, S., Lu, C.-T., Arafa, A., Zaatari, E., ... Labrique, A. (2024). The Rise of Virtual Health Care: Transforming the Health Care Landscape in the Kingdom of Saudi Arabia: A

- Review Article. *Telemedicine Journal and E-Health : The Official Journal of the American Telemedicine Association*. doi:10.1089/tmj.2024.0114
- [69] Holal, S. A. A., & Abdelwahid, H. A. (2022). Barriers Facing Primary Health Care Physicians in Jazan when Dealing with Emergency Cases. *World Family Medicine Journal /Middle East Journal of Family Medicine*. doi:10.5742/mewfm.2022.9525028
- [70] Alkhunaizi, A. N., & Aboshaiqah, A. (2023). National School Nursing Policy to Promote and Improve the Health of Overweight and Obese Children in Saudi Arabia. *Saudi Journal of Nursing and Health Care*. doi:10.36348/sjnhc.2023.v06i02.003
- [71] Daheshi, N., Alkubati, S., Villagrancia, H., Pasay-An, E., Alharbi, G., Alshammari, F., ... Alshammari, B. (2023). Nurses' Perception Regarding the Quality of Communication between Nurses and Physicians in Emergency Departments in Saudi Arabia: A Cross Sectional Study. *Healthcare*, 11. doi:10.3390/healthcare11050645
- [72] Housawi, A., Amoudi, A. A., Alsaywid, B., Lytras, M. D., Moreba, Y. B., Abuznadah, W., & Alhaidar, S. (2020). Evaluation of Key Performance Indicators (KPIs) for Sustainable Postgraduate Medical Training: An Opportunity for Implementing an Innovative Approach to Advance the Quality of Training Programs at the Saudi Commission for Health Specialties (SCFHS). *Sustainability*. doi:10.3390/SU12198030
- [73] Alshehri, B. (2016). Emergency nurses' preparedness for disaster in the Kingdom of Saudi Arabia. *Journal of Nursing Education and Practice*, 7, 101–114. doi:10.5430/JNEPV7N3P101
- [74] Baalharith, I. M. A., Sherim, M. A., Almutairi, S. H., & Albaqami, A. S. A. (2022). Telehealth and Transformation of Nursing Care in Saudi Arabia: A Systematic Review. *International Journal of Telemedicine and Applications*, 2022. doi:10.1155/2022/8426095
- [75] Aljohani, K., Alamri, M., Al-Dossary, R., Albaqawi, H., Hosis, K. F. A., Aljohani, M., ... Alharbi, J. (2022). Scope of Nursing Practice as Perceived by Nurses Working in Saudi Arabia. *International Journal of Environmental Research and Public Health*, 19. doi:10.3390/ijerph19074220
- [76] Ibrahim, F. (2014). Nurses knowledge, attitudes, practices and familiarity regarding disaster and emergency preparedness - Saudi Arabia. *American Journal of Nursing Science*, 3, 18. doi:10.11648/J.AJNS.20140302.12
- [77] Alqusumi, F. (2024). Transforming Healthcare in Saudi Arabia through Strategic Planning and Innovation. *International Journal of Integrated Science and Technology*. doi:10.59890/ijist.v2i2.1425
- [78] Winger, J., Brim, C., Dakin, C., Gentry, J. C., Killian, M., Leaver, S., ... Proehl, J. (2020). Advanced Practice Registered Nurses in the Emergency Care Setting. *Journal of Emergency Nursing: JEN: Official Publication of the Emergency Department Nurses Association*, 46 2, 205–209. doi:10.1016/j.jen.2019.12.011