



Nursing Development Opportunities in Light of Saudi Vision 2030: A Scoping Review

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ABSTRACT

Background: Saudi Vision 2030 prioritizes health-system transformation; however, persistent nursing shortages remain despite advances in education and practice. A clear synthesis of existing evidence is needed to guide reform. **Purpose:** To map the literature on nursing in Saudi Arabia and identify development opportunities aligned with Saudi Vision 2030. **Methods:** A scoping review was conducted using the approach described by Arksey and O'Malley and reported in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidance for scoping reviews. The search covered Medical Literature Analysis and Retrieval System Online, the Cumulative Index to Nursing and Allied Health Literature, and Google Scholar (January 2008 to December 2025), using terms related to the setting (Saudi Arabia), population (nursing and the nursing workforce), context (Saudi Vision 2030 and workforce nationalization), and focal domains. After duplicate removal (n = 2,175), titles (n = 1,497) and abstracts (n = 749) were screened, 120 full texts were assessed, and 31 sources were included. **Results:** Five themes were identified: (1) historical development of the profession; (2) workforce nationalization progress and barriers; (3) adoption of digital and artificial intelligence-enabled technologies; (4) continuing professional development; and (5) leadership development. The evidence highlights workforce pipeline constraints, uneven access to continuing professional development, varying readiness for digital and technological adoption, and the need to integrate leadership and system thinking earlier in nursing curricula. **Conclusion:** To realize Saudi Vision 2030, coordinated actions are needed across education, workforce nationalization, digital transformation, and leadership capacity-building. Implementation should be culturally responsive and evaluated for scalability, effectiveness, and cost. **Implications for Nursing:** Findings support prioritizing workforce retention and nationalization strategies, expanding equitable access to structured continuing professional development, strengthening digital competencies and safe technology adoption, and embedding leadership and system thinking across undergraduate and postgraduate nursing education to advance Vision 2030 goals.

Keywords: Scoping review, Saudi Vision 2030, Nursing workforce, Professional development, Artificial intelligence, Leadership.

What does this paper add?

1. This review maps nursing development opportunities in Saudi Arabia across five domains aligned with Vision 2030: historical evolution,

workforce nationalization, technology integration, continuing professional development, and leadership.

2. It identifies key gaps in the nursing workforce

pipeline, access to continuing professional development, and readiness for digital and AI-enabled practice in the Saudi context.

3. It offers culturally responsive recommendations for nursing education, workforce policy, and leadership development, and calls for rigorous evaluation of interventions for scalability and effectiveness.

Introduction

Current Status of the Nursing Profession in Saudi Arabia

At present, there is a major shortage of local nurses in the public and private healthcare sectors across Saudi Arabia (Alhindi et al., 2024). Moreover, turnover rates are especially high. Most of the national nursing workforce comprises nurses from overseas, with Saudi nationals accounting for only 29.1% in the public sector and 4.1% in the private sector (Hassan, 2017). Nonetheless, a gradual rise in the number of local nurses has been observed recently, increasing to 70,319 in 2018 (approximately 38% of all nurses) (Alsadaan et al., 2021). However, expatriates still comprise 60%-70% of nursing staff, most of whom emanate from the Philippines, Malaysia, and India (WHO, 2020).

The current demand for nursing staff has not been met, despite the significant efforts made, with projections indicating that the country will need twice as many nurses as now by 2025. This means that ~100,000 vacancies will need to be filled by 2030 (WHO, 2020). The Saudization initiative has not yet achieved its targets, and the nurse-to-population ratio is still relatively low (5.2 per 1,000 in Saudi Arabia vs. 8.2 in the UK, 9.9 in Canada, 11.2 in France, 12.6 in Australia, 13.2 in Germany, 16.4 in the USA) (Alghamdi et al., 2022).

Saudi Vision 2030

Saudi Arabia has historically relied on expatriate recruitment to meet labour market demands in technical and specialized roles, particularly during periods of rapid national development, rather than because of a lack of qualified domestic talent. This reliance has been examined in the context of broader economic factors, such as remittance outflows and the prioritization of labor market nationalization (Albejaidi & Nair, 2019). In healthcare, and especially nursing, the problem is not that Saudi nurses are out of work; rather, demand for

services is growing so rapidly that the supply of nurses in specific specialties and settings can't keep up. As a result, hospitals still need to hire nurses from other countries.

Albejaidi and Nair (2019) and Alghamdi et al. (2022) assert that economic reform targeted at infrastructure, workforce, and sustaining an evolving ecosystem has led to the 2016 launch of Vision 2030. It remains within strategy for ease of access to investment across borders. Nitaqat, the employment quota system within the Ministry of Labor, remains the most crucial measure of nationalization (Basahal, 2016).

The considerable and rapid growth of the population alongside an ever-increasing immigration rate has culminated in an uprising in demand for the services of the national healthcare system. Studies (Rahman & Al-Borie, 2021) marked the governance, financial, and political frameworks in need of realignment to managing the population's lifestyle diseases and expenditures by improving access to quality services.

To diversify its economy, Saudi Arabia has spent USD 192 billion on healthcare and education, compared to USD 147 billion on defense (Alghamdi et al., 2022). Within Saudi Vision 2030, "Caring for Our Health" is presented as a strategic direction that emphasizes strengthening the health system through improved access, quality, efficiency, prevention, and health workforce capability. In practice, this direction is aligned with national health transformation efforts that prioritize building a capable health workforce and increasing national participation in health professions, including nursing. Albejaidi and Nair (2019) discussed health-sector initiatives under Vision 2030 and highlighted the importance of sustained investment in workforce education, training, and capacity-building to meet national and international expectations for service quality.

Another key area is digitalization. Vision 2030 includes the improvement of basic IT infrastructures, primary healthcare, public health initiatives on obesity and smoking, and the organization of emergency care systems (Rahman & Al-Borie, 2021).

Pivotal are the reduction of shortages and the improvement of nurses' job satisfaction. The reforms illustrate the need for nursing in multidisciplinary teams and improving the profession's retention. Encouraging Saudi students to consider nursing is likely to increase job satisfaction (Albejaidi & Nair, 2019; Alsadaan et al., 2021; Hassan, 2017; WHO, 2020).

Research Aim

This research employed a scoping review methodology to examine the historical background of the nursing profession, as well as the major challenges, contextual factors, and societal attitudes in Saudi Arabia. It then analyzed how Vision 2030 aligns with the profession's growth and identified opportunities provided by government initiatives to support nursing development.

Methods

The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines for scoping reviews (PRISMA-ScR). Scoping review methods are used to map the breadth, nature, and characteristics of evidence, identify knowledge gaps, and clarify key concepts in a defined area of inquiry. The review process followed the staged approach described by Arksey and O'Malley (2005): (1) identifying the

review question; (2) identifying relevant evidence; (3) selecting eligible sources; (4) charting the data; and (5) collating, summarizing, and reporting the results. Stakeholder consultation was treated as an optional stage and was not undertaken.

After the search strategy and eligibility criteria were finalized, records were exported and duplicates were removed. Screening was conducted in three sequential steps: title screening, abstract screening of retained records, and full-text assessment of potentially eligible sources against the inclusion and exclusion criteria. Reasons for exclusion at the full-text stage were documented. Data was then extracted using a structured data-charting form, and the included sources were synthesized and organized into themes derived from the extracted evidence. The study selection process is summarized in the PRISMA flow diagram (Figure 1).

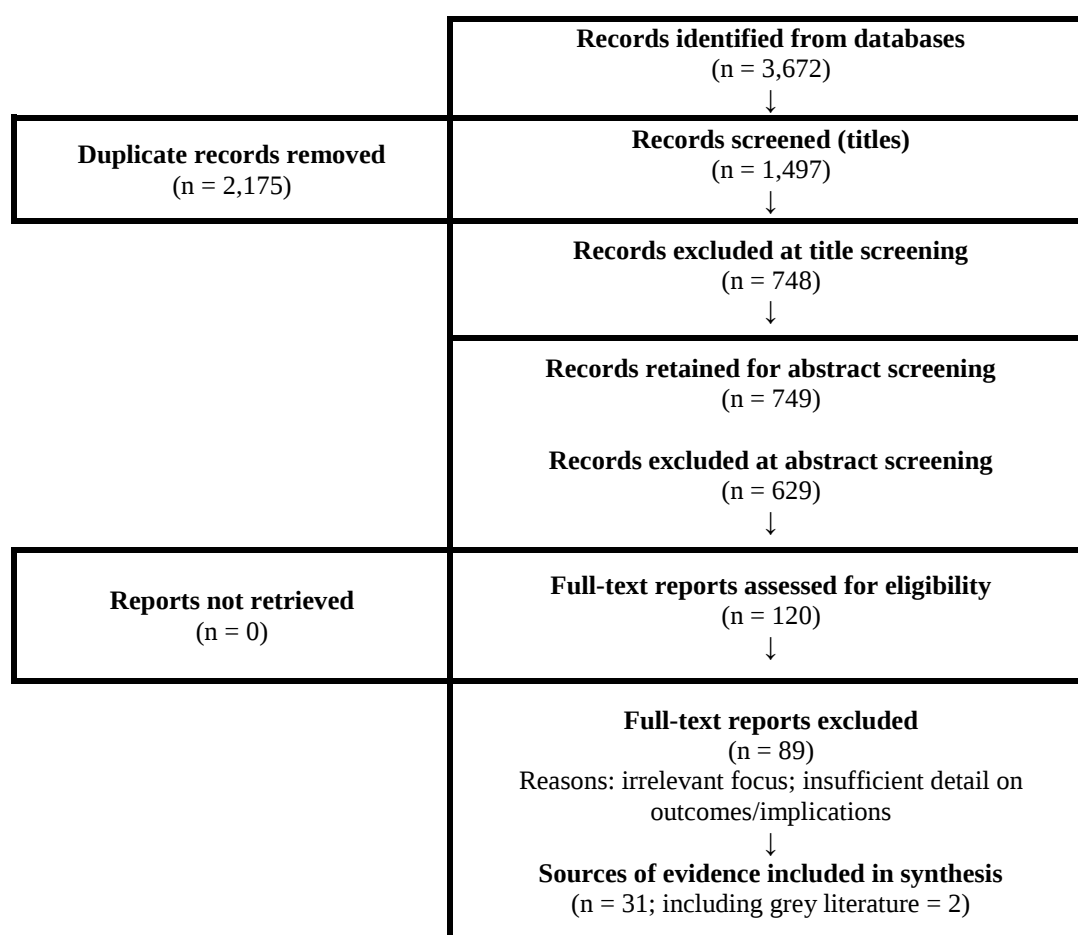


Figure 1. PRISMA-ScR flow diagram of study selection

Research Questions

The following questions guided the review:

- 1- What evidence exists on nursing development opportunities in Saudi Arabia in relation to Saudi

Vision 2030?

- 2- What are the key gaps and priorities identified across education, workforce, practice, and policy?

Selection Criteria

Inclusion Criteria: Sources were included if they (1) addressed nursing development topics relevant to the review aim and Saudi Vision 2030 priorities (for example, workforce supply and nationalization, emerging technologies and digital transformation, continuing professional development, leadership development, and professional image), (2) were conducted in Saudi Arabia or provided evidence judged to be applicable to the Saudi context (for example, regional or international literature addressing comparable workforce challenges, educational reform, or health system transformation), (3) were published between 2008 and 2025 and (4) were available as full text. Publications in both English and Arabic were eligible. Peer-reviewed articles and relevant gray literature were included.

Exclusion Criteria: Sources were excluded if they (1) were not relevant to nursing development opportunities aligned with the review aim, (2) provided

insufficient detail at full-text review to support extraction of outcomes, implications, or practice or policy relevance, or (3) were not available as full text.

To minimize confusion in interpretation, Saudi-specific sources were treated as the primary evidence base for alignment with Saudi Vision 2030, while non-Saudi sources were included only when they directly informed development opportunities considered transferable to the Saudi context.

Results

Overview of Included Sources and Thematic Organization

Thirty-one sources were included in the synthesis (including two grey literature sources). The included evidence was organized into five themes derived from the extracted data: (1) historical context and evolution of the nursing profession in Saudi Arabia; (2) workforce nationalization barriers; (3) integration of emerging technologies; (4) continuing professional development initiatives; and (5) nursing leadership development. The distribution of sources across themes is presented in Table 1.

Table 1. Selected Articles, Research Area, and Database Utilized

Research Area	Database Employed	Final Number of Articles Selected
Historical Context: The Evolution of the Nursing Profession in Saudi Arabia	CINAHL (3), Medline (1), Google Scholar (1), Grey literature (2)	7
Saudization: Obstacles to Increasing the Number of Saudi Nurses	CINAHL (4), Medline (2), Google Scholar (2), Grey literature (1)	9
Adoption of New Medical Technologies	Medline (1), Google Scholar (3)	4
Continuous Professional Development Initiatives	CINAHL (2), Medline (2)	4
Nursing Leadership Development	CINAHL (3), Medline (3), and Google Scholar (1)	7

Historical Context: The Evolution of the Nursing Profession in Saudi Arabia

Rufaidah (Rufaida) Al-Aslamia was frequently cited in nursing history as an early Muslim figure associated with organized care for injured individuals during the era of the Prophet Muhammad, including contributions during expeditions, such as Khaybar and the mobilization of women volunteers to support caregiving activities (Bodrick et al., 2022).

In Saudi Arabia, the formal development of nursing education progressed through several identifiable phases. Early accounts documented organized nursing

education initiatives beginning in 1948, reflecting efforts to meet emerging workforce needs (Aljohani, 2020). After the Ministry of Health recognized nursing as a profession in 1954, the first official nursing school was established in 1958, initially enrolling a small cohort of male students; program length and structure were later expanded in the early 1960s as training systems developed (Aljohani, 2020). With the establishment of the Ministry of Education in 1975, university-based nursing programs expanded, initially enrolling women, while admission pathways broadened over time—most notably with the acceptance of male

students into university nursing programs in 2004, alongside the expansion of bridging options toward the BSN (Aljohani, 2020). Throughout these developments, the literature emphasized ongoing attention to program design, balancing efficiency with competency development and patient safety (Almalki et al., 2011; Tumulty, 2001).

Despite educational expansion and professionalization, recruitment and enrollment remained constrained by persistent sociocultural perceptions and stereotypes that shape the public image of nursing and influence career interest (Alsadaan et al., 2021; Elmorshedy et al., 2020). Evidence from Saudi Arabia suggested that concerns related to social status, cultural expectations, and the perceived image of nursing could

discourage students from entering the profession, contributing to continuing workforce challenges (Elmorshedy et al., 2020).

In recent years, there was growth in the enrollment figures for bachelor's, master's, and even doctoral degrees in nursing along with a 5.6% growth in applications for the registered nurse preparatory courses in 2020 (Alsadaan et al., 2021; WHO, 2020). There was still a shortage of nurses, which was exacerbated by the profession's low public esteem (Hassan, 2017). A consolidated effort of the government, universities, and health providers was necessary to promote the nursing profession, which needed to focus on discipline, empathy, and the broad prospects of the profession in order to gain respect from the public.

Table 2. Final list of eligible articles selected from different databases

Research Area	Eligible Articles (Total 31)
1. Historical Context: The Evolution of the Nursing Profession in Saudi Arabia	1. Alharbi, J., and L. Al Hadid, 2019. 2. Saputra, A.H., and T. Rahmatillah, 2020. 3. Almalki, M., G. FitzGerald, and M. Clark, 2011. 4. Aljohani, K.A.S., 2020. 5. Council of Universities' Affairs. Directive No. CUA/2024/03/15: Flexible nursing curricula to reduce programme duration while maintaining academic quality and clinical skills [online announcement]. Riyadh: Council of Universities' Affairs; 2024 Mar 15 [cited 2025 Aug 6]. Available from: https://www.cua.gov.sa/en/media/announcements/2024-03-15 6. WHO. Nursing and Midwifery Personnel (per 10,000 Population). 2020; Available from: https://www.who.int/data/gho/data/indicators/indicator-details/GHO/nursing-and-midwifery-personnel-(per-10-000-population). 7. Hassan, M., <i>Strategies of improving the nursing practice in Saudi Arabia</i>. J. Health Educ. Res. Dev, 2017. 5: p. 221.
2. Saudization: Obstacles to Increasing the Number of Saudi Nurses	8. Almalki, M., G. FitzGerald, and M. Clark, 2011. 9. Al Hosis, K., V. Plummer, and M. O'Connor, 2012. 10. Alluhidan, M., et al., 2020. 11. Bell, J. 2022. 12. Stapleton, P., et al., 2007. 13. Ministry of Health. Statistical Yearbook 2018. Riyadh: Ministry of Health; 2018. 14. Albejaidi F, Nair KS. Building the health workforce: Saudi Arabia's challenges in achieving Vision 2030. <i>Int J Health Plann Manage</i>. 2019;34(4):e1405-16. 15. Bragadóttir H et al. 16. Alsadaan, N., et al., <i>Challenges Facing the Nursing Profession in Saudi Arabia: An Integrative Review</i>. Nursing Reports, 2021. 11(2): p. 395-403.
3. Adoption of New Medical Technologies	17. Davenport T, Kalakota R. 2019. 18. Cai, C.J., et al. 2019. 19. Abbott, M.B., and M. Peggy Shaw, 2016. 20. Blindheim, K., et al., 2023.

4. Continuous Professional Development Initiatives	21. Mlambo, M., C. Silén, and C. McGrath, 2021. 22. Tayyib et al. 2021. 23. Debono, D., et al., 2016. 24. Vázquez-Calatayud, M., B. Errasti-Ibarrondo, and A. Choperena, 2021.
5. Nursing Leadership Development	25. Miles, J.M., and E.S. Scott, 2019. 26. Phillips, J.M., et al., 2016. 27. Smith, T., et al., 2018. 28. Alenezi IN. 2025 29. Mahdizadeh M, Heydari A, Moonaghi HK. 2015. 30. Lancaster G, et al. 2016. 31. Zhou Y, Li Z, Li Y. 2021.

Saudization: Obstacles to Increasing the Number of Saudi Nurses

Saudization, a pivotal aspect of Vision 2030, intended to diminish the dependence on expatriate nurses while expanding the local workforce. With an annual population growth rate of 2.5%, the Kingdom was projected to need additional 64,000 nurses by 2030, nearly double the current workforce. Currently, 57% of the nurses were foreign trained (Alsadaan et al., 2021; WHO, 2020). Even though Saudization posed challenges, it was vital to the development of the workforce, diversification of the economy, and sustainable growth of the country (Albejaidi & Nair, 2019). Persistent socio-cultural stereotypes dissuaded Saudis, particularly women, from pursuing nursing as a career (Alsadaan et al., 2021). Strategies to counter this included media campaigns, organizational changes, and public initiatives inspired by the Nursing Now campaign (Alluhidan et al., 2020). Social media, especially Instagram and X (formerly Twitter), played an active role in changing perceptions (Al Hosiset al., 2012). Finally, the participation of cultural leaders might help reduce the barriers to access (Alluhidan et al., 2020). Workplace issues; i.e., burnout, absenteeism and emotional exhaustion, although common, could be minimized with better scheduling and management of workflows, communication and collaboration among employees (Bell, 2022; Bragadóttir et al., 2023). Being appropriately staffed minimized clinical mistakes, thereby improving patient safety. However, Alluhidan et al. (2020) also stated that workforce planning needed to consider cultural issues, including women's roles, resistance to night, and residual shifts. The shortage of Saudi nurses impacted patient-centered care, retention, and Saudi Arabia's position in the global healthcare market, economic diversification, and retention strengthen healthcare within the country (Alsadaan et al., 2021; Stapleton et al., 2007; WHO, 2020).

Integration of Emerging Technologies

Nursing was being transformed by artificial intelligence (AI) and machine learning (ML) through predictive analytics, chatbots, and real-time clinical decision support (Abbott & Shaw, 2016; Cai et al., 2019; Davenport & Kalakota, 2019). Their use enabled nurses to advance from being predominantly reactive caregivers to more preventive, less administratively encumbered, and more patient-centered caregivers. Social robots with conversational natural language (NLP) were used in long-term care to help decrease caregiver burden and enhance patient engagement (Blindheim et al., 2023).

In anticipation of the ongoing digital transition, Saudi nursing education was integrating technology into curricula, particularly simulation suites, AI labs, and robotics training. Learning through short courses and digital simulation systems ensured that nurses were prepared for forecasted roles in an advanced, rapidly changing healthcare system (Blindheim et al., 2023; Cai et al., 2019; Davenport & Kalakota, 2019).

Continuous Professional Development (CPD) Initiatives

CPD was crucial in fulfilling the licensure requirements while engaging in safe and evidence-based practice (Mlambo et al., 2021). Structured CPD could be customized within flexible learning environments through the integration of online self-directed learning, guided practice, and collaborative reflection (Tayyib et al., 2021). CPD initiatives in other countries, such as Australia with the Take the Lead (TTL) project, illustrated structured CPD as a means of enhancing leadership, networking among colleagues, and improving patient care (Debono et al., 2016).

There was evidence that CPD enhanced the quality

and safety of nursing practice as well as professional satisfaction and financial viability (Mlambo et al., 2021; Vázquez-Calatayud et al., 2021). The “no one size fits all” approach was more applicable to CPD, and its uptake was facilitated by a variety of factors, such as lack of time, inadequate managerial support, and curricula that were not directly associated with one’s position. The more structured CPD programs with consideration of the practitioner’s stage of career, such as clinical refreshers for graduates and advanced leadership courses for more experienced nurses, could foster participation and retention (Debono et al., 2016).

Nursing Leadership Development

Among the sources reviewed, leadership development was identified as a key priority for nursing advancement under Saudi Vision 2030 reforms. Alenezi (2025) emphasized the need for structured, ongoing leadership development for nurse managers in Saudi MOH hospitals and described how workplace and organizational factors shape leadership learning and practice, thereby aligning leadership capacity-building with Vision 2030 workforce priorities.

Leadership was further positioned as a professional competency within education and training frameworks that emphasize “knowing, doing, and being” (Miles & Scott, 2019). Phillips et al. (2016) advocated for educational approaches that help build leadership identity. Across the included sources, leadership in interprofessional teams was described as requiring coordination, communication, and shared accountability to support effective teamwork and service delivery (Smith et al., 2018). Leadership preparation was also associated with competencies in advocacy, mentoring, interprofessional collaboration, and practice-based inquiry (Lancaster et al., 2015; Mahdizadeh et al., 2015). In addition, leadership capacity-building was linked to the ability to work across disciplines, including collaboration with technical experts to support implementation and improvement in complex care systems (Zhou et al., 2021). Integrating these competencies across undergraduate and postgraduate curricula was described as fostering confidence and readiness among emerging nurse leaders to guide interprofessional teams and improve care outcomes (Miles & Scott, 2019).

Discussion

In this scoping review, the ways in which Vision

2030 promotes enhanced patient outcomes relate to organizational dynamics and interprofessional practice instead of focusing on causal relationships or evaluating the quality of evidence. The enhancement of patient care through Vision 2030 must be achieved through system-level reform as opposed to isolated professional efforts (Albejaidi & Nair, 2019). The provision of efficient and effective care is collaborative in nature, and teamwork across professional boundaries is critical (Phillips et al., 2016; Smith et al., 2018). Typically, practitioners have authority over decision-making; however, considering the expertise, hierarchical dynamics, and skills of nurses can also be highly beneficial. Nevertheless, they are often excluded from substantive care discussions (Alenezi, 2025; Lancaster et al., 2015). Similar limitations on nurse-physician collaboration are demonstrated in research conducted by Mahdizadeh et al. (2015), highlighting the necessity of addressing both institutional and cultural barriers. Each practitioner has his/her own opinion and skills. However, performance can only be optimized when those contributions are harmonized. This was evident in Malhotra's phenomenological "orchestra" metaphor Bursiek et al. (2020). Similarly, combining the special skills of doctors, nurses, and unlicensed helpers can result in truly patient-centred treatment. These relationship tendencies point to areas where education and policy might facilitate more regular, inclusive multidisciplinary discourse in this scope setting.

To tackle multi-dimensional healthcare problems, nurses, physicians, along with other professionals, need to work with IT and engineering specialists with engineering thinking through usability testing, co-design, and an iterative approach to implementation (Zhou et al, 2021). Nursing is critical to the design and implementation of data capture and workflow integration with clinical safety systems, especially in precision medicine, and in AI-enabled decision support systems (Cai et al., 2019; Davenport & Kalakota, 2019). Evidence of the benefits of joint work, such as multidisciplinary simulations, demonstrates greater improved team coordination and reduced patient falls (Bursiek et al., 2020). All of these are part of the Vision 2030 strategy focusing on technology-centered, collaborative care (Albejaidi & Nair, 2019).

Zhou et al. (2021) and other authors have identified several domains of collaborative work between nurses and engineers that have the potential to enhance care:

patient safety, nurse communication, health management, symptom monitoring, and overall workforce efficiency. Through structured dialogue interactions, engineers and nurse leaders are able to work together to design systems, such as predictive dashboards, safety alert systems, and customized communication systems (Cai et al., 2019; Davenport & Kalakota, 2019; Zhou et al., 2021). Importantly, this collaborative process is built on the premise of iterative feedback loops, where nurses use prototypes, usability problems and systems are refined, and then report on managed systems.

Interdisciplinary training programmes have been shown to improve how employees within such programmes view their work environments, and even improve some aspects of patient safety (Bursiek et al., 2020). This approach aligns with the move from a purely biomedical model of care to a more patient-centred care model that integrates biological, psychological, social and social behavioural components (Bursiek et al., 2020). In this approach, the patient's dignity, respect, and participation in the decision-making processes are highly valued.

Evidence-based practice (EBP) is the best available research in the clinical setting (Mahdizadeh et al., 2015; Rycroft-Malone et al., 2004). EBP does not inherently oppose patient-centred care. Patient preferences provide a vital link within this relationship (Bursiek et al., 2020; Rycroft-Malone et al., 2004). Including patient preferences in decision-making is a prescription for improved care (Bursiek et al., 2020). Decision-support tools, proactive nurses, and organizational enablement can result in better care.

Integrating patient-centred care with EBP is therefore essential for Vision 2030. The combination of advanced, digitally well-equipped systems, skilled nurses, and a conducive organizational environment fosters the translation of professionals' growth into practical enhancements of care standards (Bursiek et al., 2020; Zhou et al., 2021).

Implications for Nursing

This scoping review mapped evidence on nursing development in relation to Saudi Vision 2030 and identified priority opportunities across education, workforce, digital transformation, continuing professional development, and leadership capacity-building. The synthesis highlights where evidence is

concentrated and where key gaps remain, helping guide targeted action and future inquiry.

Implications for nursing include strengthening curricula to support workforce readiness, professional role identity, quality improvement, interprofessional collaboration, and, where relevant, digital health competencies. The findings also point to the value of coordinated strategies that support recruitment and retention, enhance practice environments, and expand access to structured continuing professional development. In addition, workforce stability may be strengthened by addressing professional recognition and regulatory barriers that can affect expatriate nurses' progression and retention (Fahrudin et al., 2025). Leadership capacity-building and supportive governance are also emphasized to enable nurses to contribute effectively to health system transformation. Finally, the review identifies the need for more context-specific research that evaluates the implementation, feasibility, scalability, and outcomes of nursing development initiatives in Saudi Arabia.

Conclusion

The review underscores the intersection of Vision 2030 and nursing in Saudi Arabia with regards to the Education, Workforce Nationalization, Technology Integration, Leadership, and Professional Development. While demand for nursing services continues to intensify, the Kingdom continues to grapple with a persistent nursing shortage. This shortage can be remedied by education and training pipeline acceleration, available workforce expansion, and seamless adoption of digital and AI-enabled nursing tools to support care delivery (Albejaidi & Nair, 2019; WHO, 2020). Current initiatives—such as Saudization, technological adoption, the expansion of CPD/leadership programmes and focused primary health care—promising as they may be, require strategic alignment, dynamic synergies with a culture as well as regional realities, and ongoing implementation and outcome assessment.

The primary public health requires that comprehensive nursing development strategies need to include readiness for infectious diseases, and the integration of social, economic, and cultural aspects with care. Adaptation of global initiatives to the specific realities in Saudi Arabia, such as the Take the Lead (TTL) framework, can offer significant value for local capacity development (Debono et al., 2016).

In the future, the collaboration between government agencies, academic institutions, healthcare organizations, and non-clinical partners (such as IT and engineering specialists) will be fundamental to integrating nursing practice and policy with Vision 2030. In the future, research should go beyond descriptive studies and focus on the evaluation of the scalability, effectiveness, and cost-effectiveness of interventions in multiple and varied populations and settings. This way, Saudi Arabia will be able to build a culturally appropriate and strong nursing workforce to promote quality and client-focused care.

Limitations

One researcher conducted this scoping review, which rendered the research a lengthy process. Moreover, this may also have introduced selection bias or inadvertently omitted relevant studies. Despite focusing on the context of Saudi Arabia, some international “exemplar” studies were included due to their relevance to Saudi Arabia, meaning that they enriched the theoretical scope and diversity of the research. As the key purpose of the work was to examine breadth rather than effectiveness, no formal critical appraisal was carried out. Therefore, it is essential to consider the findings as a comprehensive summary of the available evidence. Although English-language databases (CINAHL, MEDLINE, Google Scholar) served as the primary sources, some grey literature (i.e., Ministry of Health reports and WHO documents) was also employed. Nonetheless, it is possible that the review overlooked Arabic-language publications or locally archived materials that could not be identified using the selected search tools.

Implications for Policy and Practice

Health system implementation of advanced digital nursing practice roles in Saudi Arabia should be guided by structured nursing involvement in the governance, design, and evaluation of digital and artificial intelligence-enabled tools to ensure usability, safety, and workflow integration. Continuous professional development policies should align with practice-based learning and be supported by organizational infrastructure, including protected time, supervisory

Use of Artificial Intelligence (AI) Tools

There was no use of any generative AI tools for any

support, and clear progression pathways.

Policy responses should prioritize enabling strategies that encourage recruitment and retention, including policies that support work-life balance, equitable access to professional development, and scheduling models that are culturally responsive and supportive of nurses across different life and career stages. In addition, health systems should support interdisciplinary nurse-IT/engineering co-design mechanisms (for example, innovation labs and joint implementation teams) and establish evaluation frameworks to assess scalability, cost, and outcomes of nurse- and midwife-led innovations.

Ethical Considerations

This review did not involve any human participants. Publicly accessible data was synthesized in this study, meaning that ethical approval from the institution was not needed.

Data Availability

All the data used in this review is available in this article and its supplementary materials, including the PRISMA-ScR checklist, flow diagram, and charting tables. No other datasets were used or analyzed in the study.

Protocol and Registration

Before the review commenced, an internal protocol was established, which highlighted the research questions, databases (CINAHL, MEDLINE, Google Scholar), search terms/keywords, inclusion and exclusion criteria, identified themes (historical context; Saudization; use of new medical technologies; continuous professional development; nursing leadership), and the data charting method. All stages of the review were included in this protocol. However, the protocol is not registered on platforms, such as PROSPERO or OSF.

Supplementary Materials

The supplementary files attached to this work are the completed PRISMA-ScR checklist and the PRISMA flow diagram (see Figure 1). Moreover, Table 2 presents the characteristics of all studies included in the review. components of this manuscript, including, but not limited to, study design, data collection, data analysis, and manuscript writing.

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Conflict of Interests

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