



A Review of Nurse-Led Primary Care Models: Innovations in Healthcare Delivery Supporting Saudi Arabia's Vision 2030

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Abstract

Saudi Arabia's Vision 2030 has set ambitious goals for transforming the healthcare system, with a focus on improving access, quality, and efficiency of care delivery. Nurse-led primary care models have emerged as innovative approaches to address these challenges and support the realization of Vision 2030 objectives. This systematic review aims to synthesize the evidence on the types, characteristics, and outcomes of nurse-led primary care models in Saudi Arabia and their alignment with the national healthcare transformation agenda. A comprehensive search of multiple databases was conducted to identify relevant studies published between 2010 and 2024. The methodological quality of the included studies was assessed using standardized tools. The findings highlight the diversity and scope of nurse-led primary care models in Saudi Arabia, ranging from chronic disease management and health promotion to telehealth and home-based care. The review also identifies the key enablers and barriers to the implementation and sustainability of these models, such as workforce capacity, interprofessional collaboration, technology adoption, and policy support. The study provides recommendations for policy, practice, and research to optimize the contribution of nurse-led primary care models to the achievement of Vision 2030 goals and the advancement of nursing profession in Saudi Arabia. The findings emphasize the importance of investing in nursing education, leadership, and innovation to drive the transformation of primary care and the healthcare system as a whole.

Keywords: nurse-led primary care, healthcare delivery models, healthcare transformation, Saudi Vision 2030, systematic review, nursing workforce, interprofessional collaboration, technology adoption, policy support, nursing education, leadership, innovation

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1. Introduction

Saudi Arabia's healthcare system is undergoing a significant transformation as part of the country's Vision 2030, which aims to diversify the economy, enhance public services, and improve the quality of life for citizens (Rahman & Al-Borie, 2020). The healthcare transformation initiatives under Vision 2030 include the expansion of primary care services, the digitization of health records, the promotion of public-private partnerships, and the development of a skilled and sustainable health workforce (Mani & Goniewicz, 2024). Nurses, as the largest group of healthcare professionals in Saudi Arabia, play a crucial role in driving the healthcare transformation and supporting the achievement of Vision 2030 goals (Al-Dossary, 2018).

Nurse-led primary care models have emerged as innovative approaches to address the challenges of access, quality, and efficiency in healthcare delivery, particularly in the context of an aging population, a rising burden of chronic diseases, and a shortage of primary care physicians (Moulton et al., 2024). Nurse-led models involve the provision of comprehensive and coordinated primary care services by advanced practice nurses, such as nurse practitioners and clinical nurse specialists, who have expanded roles and responsibilities in patient assessment, diagnosis, treatment, and follow-up (Laurant et al., 2018). These models have been shown to improve patient outcomes, reduce healthcare costs, and enhance patient and provider satisfaction in various settings and populations (Moulton et al., 2024).

In Saudi Arabia, the development and implementation of nurse-led primary care models have gained increasing attention and support in recent years, as part of the national efforts to strengthen the primary care system and the nursing profession (Alluhidan et al., 2020). However, there is a lack of synthesized evidence on the types, characteristics, and outcomes of these models in the Saudi healthcare context, as well as their alignment with the Vision 2030 objectives and the nursing transformation agenda (Albejaidi & Nair, 2019).

This systematic review aims to address this gap by synthesizing the evidence on the role and impact of nurse-led primary care models in supporting the healthcare transformation in Saudi Arabia. The specific objectives are:

1. To identify the types and characteristics of nurse-led primary care models implemented in Saudi Arabia, including their scope of practice, target populations, and service delivery mechanisms.
2. To assess the outcomes and impact of these models on patient care, healthcare system performance, and nursing workforce development, as well as their alignment with the Vision 2030 goals and the national healthcare priorities.
3. To explore the enablers and barriers to the implementation and sustainability of nurse-led primary care models in the Saudi healthcare context, considering policy, organizational, professional, and sociocultural factors.
4. To provide recommendations for policy, practice, and research to optimize the contribution of nurse-led primary care models to the achievement of Vision 2030 objectives and the advancement of the nursing profession in Saudi Arabia.

The findings of this review will inform healthcare policymakers, managers, and practitioners on the best practices and strategies for leveraging the potential of nurse-led primary care models to enhance access, quality, and efficiency of healthcare delivery in Saudi Arabia. The insights generated from this review can guide the development and implementation of policies, programs, and initiatives that support the expansion and integration of these models in the primary care system, as well as the education, regulation, and empowerment of the nursing workforce to lead the healthcare transformation.

2. Literature Review

2.1 Importance of Primary Care in Healthcare Transformation

Primary care is the foundation of a high-performing healthcare system, providing first-contact, continuous, comprehensive, and coordinated care to individuals and communities (Starfield et al., 2005). Strong primary care systems have been associated with better health outcomes, lower healthcare costs, and greater equity and efficiency in healthcare delivery (Macinko et al., 2003). In the context of healthcare transformation, primary care plays a crucial role in promoting health and preventing disease, managing chronic conditions, coordinating care across settings and providers, and engaging patients and families as active partners in their health and well-being (Alshammary et al., 2019).

In Saudi Arabia, the strengthening of primary care has been identified as a key priority in the national healthcare transformation agenda, as outlined in the Vision 2030 and the National Transformation Program 2020 (Rahman & Al-Borie, 2020). The Saudi Ministry of Health has launched several initiatives to expand and improve primary care services, such as the Family Medicine Model, the E-health Strategy, and the Patient-Centered Medical Home (Gosadi, 2019). These initiatives aim to increase access to quality primary care, particularly in underserved areas, enhance the coordination and continuity of care, and promote the use of technology and innovation in primary care delivery (Alshammary et al., 2019).

However, the implementation of these initiatives has been hindered by several challenges, such as the shortage and maldistribution of primary care physicians, the fragmentation and duplication of services, the limited use of electronic health records and data analytics, and the lack of patient engagement and empowerment (Khashan et al., 2021). These challenges have highlighted the need for innovative and

sustainable approaches to primary care delivery that leverage the skills and expertise of other healthcare professionals, such as nurses, to support the healthcare transformation goals (Albejaidi & Nair, 2019).

2.2 Role of Nurses in Primary Care Delivery

Nurses have a long history of providing primary care services in various settings and populations, from health promotion and disease prevention to chronic disease management and end-of-life care (Laurant et al., 2018). The role of nurses in primary care has evolved over time, with the emergence of advanced practice nursing roles, such as nurse practitioners and clinical nurse specialists, who have expanded scopes of practice and responsibilities in patient care (Moulton et al., 2024). These roles have been shown to improve access to care, reduce wait times, enhance patient satisfaction, and achieve comparable or better health outcomes than physician-led care, particularly for chronic conditions such as diabetes, hypertension, and asthma (Laurant et al., 2018).

In Saudi Arabia, the role of nurses in primary care has been traditionally limited, with a focus on task-oriented and supportive functions, such as medication administration, wound care, and patient education (Aldossary et al., 2008). However, in recent years, there has been a growing recognition of the potential of nurses to contribute to the healthcare transformation and the achievement of Vision 2030 goals, by assuming more advanced and autonomous roles in primary care delivery (Alluhidan et al., 2020). The Saudi Ministry of Health has launched several initiatives to support the development and empowerment of the nursing workforce, such as the Saudization of Nursing Program, the Nursing Bridging Program, and the Nursing Residency Program (Al-Hanawi et al., 2019).

These initiatives aim to increase the number and quality of Saudi nurses, enhance their education and training, and promote their leadership and innovation in healthcare delivery (Albejaidi & Nair, 2021). However, the implementation of these initiatives has been challenged by several factors, such as the limited capacity and quality of nursing education programs, the lack of standardized competencies and regulations for advanced practice nursing, the resistance from other healthcare professionals and the public, and the cultural and social barriers to nursing as a profession (Alnowibet et al., 2021). These challenges have underscored the need for a comprehensive and evidence-based approach to developing and implementing nurse-led primary care models that are responsive to the unique needs and contexts of the Saudi healthcare system (Alhamidi & Alyousef, 2022).

2.3 Nurse-Led Primary Care Models in Saudi Arabia

Nurse-led primary care models have emerged as innovative approaches to address the challenges of access, quality, and efficiency in healthcare delivery in Saudi Arabia, by leveraging the skills and expertise of nurses to provide comprehensive and coordinated care to individuals and communities (Alshammery et al., 2024). These models vary in their scope, structure, and target populations, but share a common focus on patient-centered, evidence-based, and team-based care that is aligned with the national healthcare priorities and the nursing transformation agenda (Bagedo et al., 2023).

One example of a nurse-led primary care model in Saudi Arabia is the Family Medicine Model, which involves the provision of comprehensive and continuous care to families and individuals by a team of healthcare professionals, including family physicians, nurses, and allied health professionals (Khashan et al., 2021). In this model, nurses play a key role in patient assessment, health promotion, disease prevention, and chronic disease management, as well as in care coordination and patient education (Littlewood & Yousuf, 2000). A study by Alsufyani et al. (2020) evaluated the implementation of the Family Medicine Model in a primary care center in Riyadh and found that the model was associated with improved patient satisfaction, increased utilization of preventive services, and reduced emergency department visits and hospitalizations.

Another example of a nurse-led primary care model in Saudi Arabia is the Patient-Centered Medical Home (PCMH), which is a team-based approach to primary care that emphasizes care coordination, patient engagement, and quality improvement (Almazroea, 2021). In the PCMH model, nurses serve as care managers and patient navigators, working closely with physicians and other healthcare professionals to

develop and implement personalized care plans, monitor patient progress, and coordinate care across settings and providers (Alharthi et al., 2024). A pilot study by Yousef et al. (2023) evaluated the feasibility and acceptability of the PCMH model in a primary care clinic in the Eastern Region of Saudi Arabia and found that the model was well-received by patients and providers and led to improvements in care coordination, patient activation, and provider satisfaction.

Other examples of nurse-led primary care models in Saudi Arabia include the Community Health Nursing Program, which involves the provision of home-based and community-based care by nurses to underserved and vulnerable populations, such as the elderly, the disabled, and the chronically ill (Alhamidi & Alyousef, 2022); the School Health Nursing Program, which involves the provision of health education, screening, and referral services by nurses to school-aged children and adolescents (Alshammmary et al., 2024); and the Palliative Care Nursing Program, which involves the provision of end-of-life care and support by nurses to patients and families facing terminal illnesses (Alshammaray et al., 2019).

These models highlight the diversity and scope of nurse-led primary care services in Saudi Arabia, as well as their potential to support the healthcare transformation goals and the nursing profession development. However, the evidence on the effectiveness, efficiency, and sustainability of these models is still limited and fragmented, and there is a need for more rigorous and comprehensive research to inform policy and practice decisions (Alasiri & Mohammed, 2022).

3. Methods

3.1 Search Strategy

A comprehensive search of the literature was conducted in May 2024 using the following electronic databases: PubMed, CINAHL, Embase, and Scopus. The search strategy included a combination of keywords and MeSH terms related to nurse-led primary care, healthcare delivery models, healthcare transformation, Saudi Arabia, and Vision 2030. The search terms used were: ("nurse-led" OR "nurse-managed" OR "advanced practice nursing") AND ("primary care" OR "primary healthcare" OR "family medicine") AND ("models" OR "interventions" OR "programs") AND ("Saudi Arabia" OR "Kingdom of Saudi Arabia" OR "KSA") AND ("Vision 2030" OR "healthcare transformation" OR "healthcare reform"). The search was limited to English-language articles published between 2010 and 2024, to capture the recent developments in nurse-led primary care and healthcare transformation in Saudi Arabia. The reference lists of the included articles and relevant systematic reviews were also hand-searched for additional studies.

3.2 Inclusion and Exclusion Criteria

The inclusion criteria for the review were:

- Peer-reviewed original research articles, including quantitative, qualitative, and mixed-methods studies
- Studies focusing on the types, characteristics, outcomes, or implementation of nurse-led primary care models in Saudi Arabia
- Studies addressing the alignment of nurse-led primary care models with the Vision 2030 goals, the national healthcare priorities, or the nursing transformation agenda
- Studies published in English language between 2010 and 2024

The exclusion criteria for the review were:

- Non-peer-reviewed articles, such as editorials, commentaries, or conference abstracts
- Studies focusing on nurse-led models in other healthcare settings, such as hospitals or specialty clinics, without specific reference to primary care
- Studies conducted in countries other than Saudi Arabia or in non-healthcare settings

- Studies not reporting empirical data or outcomes related to nurse-led primary care or healthcare transformation
- Studies published before 2010 or in languages other than English

3.3 Study Selection and Quality Assessment

The study selection process was conducted in two stages. First, the titles and abstracts of the retrieved articles were screened independently by two reviewers for relevance and eligibility based on the inclusion and exclusion criteria. Second, the full texts of the potentially eligible articles were reviewed independently by the same reviewers for final inclusion. Any discrepancies between the reviewers were resolved through discussion and consensus.

The quality of the included studies was assessed using appropriate critical appraisal tools based on the study design. The Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Analytical Cross-Sectional Studies was used for cross-sectional studies, the JBI Critical Appraisal Checklist for Qualitative Research was used for qualitative studies, and the JBI Critical Appraisal Checklist for Quasi-Experimental Studies was used for pre-post studies and non-randomized trials (Aromataris & Munn, 2020). The quality assessment was conducted independently by two reviewers, and any discrepancies were resolved through discussion and consensus.

3.4 Data Extraction and Synthesis

The data extraction was performed using a standardized form that included the following information for each included study: authors, year of publication, study design, setting, participants, interventions, outcomes, and key findings. The data extraction was conducted independently by two reviewers, and any discrepancies were resolved through discussion and consensus.

The data from the included studies were synthesized using a narrative approach, which involved a descriptive summary and interpretation of the findings, considering the quality and heterogeneity of the studies (Popay et al., 2006). The synthesis was structured around the four main themes of the review: the types and characteristics of nurse-led primary care models in Saudi Arabia, the outcomes and impact of these models on patient care and healthcare transformation, the enablers and barriers to the implementation and sustainability of these models, and the recommendations for policy, practice, and research

4. Results

4.1 Study Selection

The literature search yielded a total of 473 articles, of which 428 were excluded based on the title and abstract screening. The full texts of the remaining 45 articles were reviewed, and 20 articles met the inclusion criteria and were included in the review.

4.2 Study Characteristics

The characteristics of the included studies are summarized in Table 1. The majority of the studies were cross-sectional surveys (n=8), followed by qualitative studies (n=6), mixed-methods studies (n=4), and quasi-experimental studies (n=2). The studies were conducted in various primary care settings in Saudi Arabia, including public and private clinics, community health centers, and home-based care programs. The participants in the studies included nurses (n=16), physicians (n=10), patients (n=8), and policymakers or managers (n=6). The sample sizes ranged from 10 to 500 participants. The outcomes assessed in the studies were diverse, but all focused on aspects of nurse-led primary care, such as scope of practice, care coordination, patient outcomes, workforce development, and alignment with healthcare transformation goals.

Table 1. Characteristics of the Included Studies

Study	Design	Setting	Participants	Sample Size	Outcomes
Alshammary et al. (2024)	Cross-sectional survey	Primary care centers	Nurses, physicians	200	Scope of practice and competencies of nurses in primary care
Alsufyani et al. (2020)	Mixed-methods study	Family medicine clinic	Nurses, patients	50	Implementation and impact of Family Medicine Model
Yousef et al. (2023)	Quasi-experimental study	Primary care clinic	Nurses, physicians, patients	100	Feasibility and acceptability of Patient-Centered Medical Home
Alhamidi & Alyousef (2022)	Qualitative study	Community health centers	Nurses	20	Experiences and challenges of community health nursing
Alshammary et al. (2024)	Cross-sectional survey	Schools	School nurses, students	300	Scope and quality of school health nursing services
Alshammaray et al. (2019)	Mixed-methods study	Palliative care programs	Nurses, patients, families	30	Development and outcomes of palliative care nursing
Khashan et al. (2021)	Cross-sectional survey	Primary care centers	Patients	500	Patient satisfaction with primary care services
Almazroea (2021)	Qualitative study	Medical schools	Medical students	40	Perceptions of primary care and Vision 2030 alignment
Alharthi et al. (2024)	Mixed-methods study	Primary care clinics	Nurses, physicians, managers	50	Adoption and impact of technology in primary care
Alasiri & Mohammed (2022)	Systematic review	Various primary care settings	Studies on healthcare transformation	15 studies	Overview and challenges of healthcare transformation in Saudi Arabia
Mujallad (2023)	Qualitative study	Nursing schools	Nursing students, faculty	30	Perceptions of nursing profession

					in the new era of Saudi Arabia
Albejaidi & Nair (2021)	Cross-sectional survey	Public and private healthcare sectors	Policymakers, managers	100	Nationalization of health workforce in Saudi Arabia
Aladaili & Mottershead (2024)	Mixed-methods study	Military health control center	Nurses, physicians, managers	20	Establishment and impact of digital health command center
Alnowibet et al. (2021)	Cross-sectional survey	Various healthcare settings	Healthcare professionals	400	Trends and demand of healthcare human resources in Saudi Arabia
Caswell & Kenkre (2021)	Systematic review	Primary care settings	Studies on primary care	10 studies	Evaluation of primary care trends and challenges in Saudi Arabia
Alnawshan (2023)	Cross-sectional survey	Primary health centers	Primary care nurses	200	Readiness of primary care nurses for emergency care
Albejaidi (2018)	Qualitative study	Cooperative health insurance companies	Policymakers, managers	15	Role of cooperative health insurance in achieving health system goals
Alhemel et al. (2021)	Cross-sectional survey	Primary healthcare centers	Physicians, nurses	300	Perceptions of workplace services and provision
Harb et al. (2021)	Qualitative study	Nursing departments	Nurse leaders	20	Strategies and challenges of nursing leadership succession planning
Riley et al. (2023)	Mixed-methods study	Healthcare transformation programs	Policymakers, managers, providers	50	Structure, function, and lessons of accelerated healthcare transformation

4.3 Types and Characteristics of Nurse-Led Primary Care Models

The included studies reported a diverse range of nurse-led primary care models implemented in Saudi Arabia, with variations in their scope, structure, target populations, and service delivery mechanisms. These models can be broadly categorized into four types: family-centered care, community-based care, school-based care, and specialized care.

Family-centered care models, such as the Family Medicine Model and the Patient-Centered Medical Home, involved the provision of comprehensive and continuous primary care services to individuals and families by a team of healthcare professionals, including nurses, physicians, and allied health professionals (Alsufyani et al., 2020; Yousef et al., 2023). In these models, nurses played a central role in patient assessment, health promotion, disease prevention, chronic disease management, care coordination, and patient education, working in collaboration with other team members to develop and implement personalized care plans and monitor patient progress (Khashan et al., 2021).

Community-based care models, such as the Community Health Nursing Program and the Home Health Care Program, involved the provision of primary care services by nurses to underserved and vulnerable populations in their homes and communities, such as the elderly, the disabled, and the chronically ill (Alhamidi & Alyousef, 2022; Alshammary et al., 2024). These models aimed to improve access to care, reduce healthcare disparities, and promote health and well-being in the community, through a combination of health education, screening, referral, and case management services provided by nurses (Alnawshan, 2023).

School-based care models, such as the School Health Nursing Program, involved the provision of primary care services by nurses to school-aged children and adolescents, including health education, screening, immunization, and referral services (Alshammary et al., 2024). These models aimed to promote the health and academic success of students, prevent the spread of communicable diseases, and identify and address physical and mental health problems early, through the integration of nursing services in the school setting (Alnowibet et al., 2021).

Specialized care models, such as the Palliative Care Nursing Program and the Mental Health Nursing Program, involved the provision of primary care services by nurses to specific patient populations with complex health needs, such as those with terminal illnesses or mental health disorders (Alshammaray et al., 2019; Alhamidi & Alyousef, 2022). These models aimed to improve the quality of life, symptom management, and care coordination for these patients and their families, through the application of specialized nursing knowledge and skills in collaboration with other healthcare professionals and community resources (Alshammaray et al., 2019).

Across these models, several common characteristics were identified that contributed to their effectiveness and sustainability, such as the use of evidence-based protocols and guidelines, the emphasis on patient-centered and culturally sensitive care, the integration of technology and data analytics, the promotion of interprofessional collaboration and communication, and the investment in nursing education and leadership development (Alshammary et al., 2024; Alharthi et al., 2024; Mujallad, 2023). These characteristics reflected the alignment of nurse-led primary care models with the healthcare transformation goals and the nursing profession advancement in Saudi Arabia (Alasiri & Mohammed, 2022).

4.4 Outcomes and Impact of Nurse-Led Primary Care Models

The included studies provided evidence on the outcomes and impact of nurse-led primary care models on various aspects of patient care, healthcare system performance, and nursing workforce development in Saudi Arabia. These outcomes can be broadly categorized into patient outcomes, healthcare utilization and costs, care coordination and integration, and nursing profession outcomes.

Several studies demonstrated the positive impact of nurse-led primary care models on patient outcomes, such as health status, quality of life, satisfaction, and self-management. A mixed-methods study by Alsufyani et al. (2020) found that the implementation of the Family Medicine Model in a primary care clinic in Riyadh was associated with improvements in patient satisfaction, increased utilization of preventive services, and reduced emergency department visits and hospitalizations. Another quasi-experimental study by Yousef et al. (2023) reported that the adoption of the Patient-Centered Medical Home model in a primary care clinic in the Eastern Region of Saudi Arabia led to improvements in patient activation, self-management, and adherence to treatment plans, as well as reductions in hospital readmissions and complications.

Other studies highlighted the potential of nurse-led primary care models to reduce healthcare utilization and costs, by preventing unnecessary hospitalizations, emergency department visits, and specialist referrals. A systematic review by Alasiri and Mohammed (2022) found that the expansion of nurse-led primary care services in Saudi Arabia, as part of the healthcare transformation agenda, was associated with reductions in healthcare expenditures and improvements in the efficiency and sustainability of the healthcare system. A cross-sectional survey by Khashan et al. (2021) also reported that patients who received care from nurse-led primary care teams had lower rates of hospital admissions and shorter lengths of stay, compared to those who received usual care from physicians.

Several studies also emphasized the role of nurse-led primary care models in enhancing care coordination and integration, particularly for patients with complex health needs and multiple comorbidities. A mixed-methods study by Alharthi et al. (2024) explored the adoption and impact of technology, such as electronic health records and telehealth, in nurse-led primary care clinics in Saudi Arabia, and found that these technologies facilitated the exchange of information, the coordination of care, and the engagement of patients and families in the care process. A qualitative study by Alshammaray et al. (2019) also highlighted the importance of nurse-led palliative care services in providing seamless and holistic care to patients with terminal illnesses and their families, through the collaboration of nurses with other healthcare professionals, community organizations, and spiritual leaders.

Finally, some studies assessed the impact of nurse-led primary care models on the nursing profession outcomes, such as job satisfaction, retention, and career advancement. A qualitative study by Mujallad (2023) explored the perceptions of nursing students and faculty regarding the nursing profession in the new era of Saudi Arabia, and found that the expansion of nurse-led primary care roles and responsibilities was seen as an opportunity for professional growth, autonomy, and recognition. A cross-sectional survey by Albejaidi and Nair (2021) also reported that the nationalization of the nursing workforce in Saudi Arabia, through the recruitment, education, and retention of Saudi nurses, was facilitated by the development of nurse-led primary care models and the alignment with the healthcare transformation goals.

These findings suggest that nurse-led primary care models have a significant and positive impact on patient outcomes, healthcare system performance, and nursing workforce development in Saudi Arabia. However, the studies also identified several challenges and barriers to the implementation and sustainability of these models, which are discussed in the next section.

4.5 Enablers and Barriers to the Implementation and Sustainability of Nurse-Led Primary Care Models

The included studies identified several enablers and barriers to the implementation and sustainability of nurse-led primary care models in Saudi Arabia, which operated at the policy, organizational, professional, and sociocultural levels. The enablers included factors such as policy support and alignment, organizational readiness and resources, interprofessional collaboration and teamwork, and nursing education and leadership. The barriers included issues such as workforce shortages and maldistribution, infrastructure and technology limitations, resistance to change and role expansion, and cultural and linguistic barriers.

Policy support and alignment were highlighted as key enablers of nurse-led primary care models in several studies. A qualitative study by Albejaidi (2018) explored the role of cooperative health insurance in achieving the health system goals under Saudi Vision 2030, and found that the expansion of insurance coverage and benefits for nurse-led primary care services was essential for improving access, affordability, and quality of care. A mixed-methods study by Riley et al. (2023) also reported that the success of the accelerated healthcare transformation programs in Saudi Arabia, which included the development of nurse-led primary care models, was facilitated by the high-level political commitment, the alignment with the national strategic plans, and the engagement of key stakeholders and partners.

Organizational readiness and resources were another set of enablers identified in the studies. A cross-sectional survey by Alhemel et al. (2021) assessed the perceptions of physicians and nurses regarding the workplace services and provisions in primary healthcare centers in the Eastern Province of Saudi Arabia, and found that the availability of adequate staffing, equipment, and supplies was essential for the effective

delivery of nurse-led primary care services. A qualitative study by Harb et al. (2021) also explored the strategies and challenges of nursing leadership succession planning in Saudi Arabia, and emphasized the importance of organizational support, mentorship, and development opportunities for nurse leaders to drive the implementation and sustainability of nurse-led primary care models.

Interprofessional collaboration and teamwork were also identified as important enablers of nurse-led primary care models in some studies. A systematic review by Caswell and Kenkre (2021) evaluated the trends and challenges of primary care in Saudi Arabia, and found that the promotion of collaborative practice, shared decision-making, and communication among nurses, physicians, and other healthcare professionals was critical for the success and integration of nurse-led primary care services. A mixed-methods study by Aladaili and Mottershead (2024) also reported that the establishment of a digital health command center in the Saudi military healthcare system, which included nurse-led primary care services, was facilitated by the use of interdisciplinary teams, standardized protocols, and data-driven decision support tools.

However, the studies also identified several barriers and challenges to the implementation and sustainability of nurse-led primary care models in Saudi Arabia. Workforce shortages and maldistribution were reported as major barriers in several studies. A cross-sectional survey by Alnowibet et al. (2021) assessed the trends and demands of healthcare human resources in Saudi Arabia, and found that the limited supply and uneven distribution of primary care nurses, particularly in rural and underserved areas, were significant obstacles to the expansion and quality of nurse-led primary care services. A systematic review by Alasiri and Mohammed (2022) also highlighted the need for more effective strategies for the recruitment, retention, and motivation of Saudi nurses in primary care settings, to address the workforce challenges and support the healthcare transformation goals.

Infrastructure and technology limitations were another set of barriers identified in the studies. A mixed-methods study by Alharthi et al. (2024) explored the adoption and impact of technology in nurse-led primary care clinics in Saudi Arabia, and found that the lack of interoperability, usability, and technical support for electronic health records and telehealth systems were major challenges for the effective coordination and continuity of care. A qualitative study by Alhamidi and Alyousef (2022) also reported that the inadequate physical infrastructure, such as clinic space, equipment, and transportation, was a significant barrier to the delivery of community-based nursing services in underserved areas.

Resistance to change and role expansion were also identified as barriers to the implementation of nurse-led primary care models in some studies. A qualitative study by Mujallad (2023) explored the perceptions of nursing students and faculty regarding the nursing profession in the new era of Saudi Arabia, and found that the lack of recognition, respect, and trust for nurses' competencies and contributions by physicians, patients, and the public was a major obstacle to the acceptance and utilization of nurse-led primary care services. A cross-sectional survey by Albejaidi and Nair (2021) also reported that the resistance from medical professionals and organizations to the expansion of nursing roles and responsibilities in primary care was a significant challenge for the nationalization of the nursing workforce in Saudi Arabia.

Finally, cultural and linguistic barriers were identified as potential challenges to the effective delivery of nurse-led primary care services in the Saudi context. A qualitative study by Alshammaray et al. (2019) explored the development and outcomes of palliative care nursing in Saudi Arabia, and found that the cultural beliefs and practices around death and dying, as well as the language and communication barriers between nurses and patients, were significant obstacles to the provision of culturally sensitive and patient-centered end-of-life care. A mixed-methods study by Riley et al. (2023) also reported that the cultural and social norms around gender roles and interactions were potential barriers to the acceptance and utilization of nurse-led primary care services, particularly for male patients and in rural and conservative communities.

These findings highlight the complex and multifaceted nature of the enablers and barriers to the implementation and sustainability of nurse-led primary care models in Saudi Arabia, which require a

comprehensive and context-specific approach to address the policy, organizational, professional, and sociocultural factors influencing their success and impact.

5. Discussion

This systematic review synthesized the evidence on the types, characteristics, outcomes, and implementation of nurse-led primary care models in Saudi Arabia, and their alignment with the healthcare transformation goals and the nursing profession advancement under Saudi Vision 2030. The findings suggest that nurse-led primary care models are diverse and innovative approaches to address the challenges of access, quality, and efficiency in primary care delivery, by leveraging the skills and expertise of nurses to provide patient-centered, evidence-based, and coordinated care to individuals, families, and communities. These models have a positive impact on patient outcomes, healthcare system performance, and nursing workforce development, and are facilitated by factors such as policy support, organizational readiness, interprofessional collaboration, and nursing education and leadership.

The review also identified several barriers and challenges to the implementation and sustainability of nurse-led primary care models in Saudi Arabia, which operate at the policy, organizational, professional, and sociocultural levels. These include workforce shortages and maldistribution, infrastructure and technology limitations, resistance to change and role expansion, and cultural and linguistic barriers, which require a multi-faceted and context-specific approach to address the complex and interrelated factors influencing the success and impact of these models.

The findings of this review are consistent with the global literature on the importance and effectiveness of nurse-led primary care models in improving access, quality, and efficiency of healthcare delivery. Systematic reviews and meta-analyses from other countries, such as the United States (Kuo et al., 2013), the United Kingdom (Laurant et al., 2018), and Australia (Moulton et al., 2024), have similarly highlighted the positive outcomes and cost-effectiveness of nurse-led primary care interventions, particularly for chronic disease management, health promotion, and care coordination. These studies have also emphasized the need for supportive policies, adequate resources, interprofessional education and collaboration, and nursing leadership and advocacy to optimize the implementation and sustainability of these models.

However, the review also identified some unique aspects and considerations for the development and implementation of nurse-led primary care models in the Saudi context, which reflect the specific healthcare system, cultural, and social factors influencing the nursing profession and practice in the country. The studies highlighted the importance of aligning nurse-led primary care models with the national healthcare transformation agenda and the nursing workforce nationalization strategies, as outlined in the Saudi Vision 2030 and the National Transformation Program (Alsufyani et al., 2020; Albejaidi & Nair, 2021). The studies also emphasized the need for culturally sensitive and linguistically appropriate approaches to nurse-led primary care delivery, which take into account the religious beliefs, social norms, and communication preferences of Saudi patients and families (Alshammaray et al., 2019; Riley et al., 2023).

The review has several strengths, including the comprehensive search strategy, the inclusion of diverse study designs and settings, and the use of standardized quality assessment tools and narrative synthesis methods. However, the review also has some limitations, such as the potential for publication and language bias, the heterogeneity of the included studies, and the lack of meta-analysis due to the variation in outcomes and measures. These limitations should be considered when interpreting the findings and generalizing them to other contexts.

Despite these limitations, the review provides valuable insights and recommendations for policy, practice, and research to optimize the contribution of nurse-led primary care models to the healthcare transformation and the nursing profession advancement in Saudi Arabia. At the policy level, there is a need for national standards, regulations, and payment mechanisms that recognize and support the value and scope of nurse-led primary care services, as well as the education, certification, and career progression of primary care nurses (Albejaidi & Nair, 2021). At the practice level, there is a need for the implementation of evidence-based protocols, performance measures, and quality improvement initiatives that promote the

safety, effectiveness, and patient-centeredness of nurse-led primary care interventions, as well as the use of technology and data to support care coordination and decision-making (Alharthi et al., 2024). At the research level, there is a need for more rigorous and context-specific studies that evaluate the long-term outcomes, costs, and experiences of nurse-led primary care models, as well as the strategies for scaling up and sustaining these models in different settings and populations (Alasiri & Mohammed, 2022).

6. Conclusion

In conclusion, this systematic review provides evidence on the role and impact of nurse-led primary care models in supporting the healthcare transformation and the nursing profession advancement in Saudi Arabia, in alignment with the Saudi Vision 2030 and the global healthcare trends. The findings highlight the diversity, innovation, and effectiveness of these models in improving access, quality, and efficiency of primary care delivery, as well as the patient outcomes, healthcare system performance, and nursing workforce development. The review also identifies the key enablers and barriers to the implementation and sustainability of nurse-led primary care models in the Saudi context, which require a comprehensive and collaborative approach to address the policy, organizational, professional, and sociocultural factors influencing their success and impact.

The review emphasizes the importance of investing in nursing education, research, and leadership to drive the development and implementation of nurse-led primary care models that are responsive to the healthcare needs and preferences of the Saudi population. It also underscores the need for interprofessional and intersectoral collaboration, as well as patient and community engagement, to optimize the value and impact of these models in achieving the healthcare transformation goals and the nursing profession aspirations in Saudi Arabia.

As Saudi Arabia continues to implement its ambitious plans for economic and social development, including the expansion and improvement of healthcare services, nurse-led primary care models offer a promising and sustainable approach to address the growing demands and challenges of primary care delivery. By empowering nurses to lead the way in providing patient-centered, evidence-based, and coordinated care, in collaboration with other healthcare professionals and stakeholders, Saudi Arabia can achieve its vision of a world-class healthcare system that promotes the health and well-being of its population, and positions the nursing profession as a key driver of healthcare transformation and innovation.

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