Tackling Chronic Diseases: Saudi Nursing's Pivotal Role in Vision 2030 Health Initiatives

[1]Abdullah Haif Onaiber Aldhafeeri ,[2]Abdullaziz Hajjaj Onaiber Aldhafeeri ,[3]Khalaf Fahad Alshammari ,[4]Anwar Hussain Hamd Alshammari ,[5]Mansour Galeb Lafi Alenazy ,[6]Ahmed Matar Sinjar Aldhafeeri ,[7]Shimah Baten Oniber Aldhafeeri

1,2,3,4,5,6,7 Nursing

Abstract

Saudi Arabia's Vision 2030 outlines ambitious goals for healthcare transformation, with a focus on tackling the growing burden of chronic diseases and improving population health outcomes. Nurses, as the largest healthcare workforce in the country, have a pivotal role to play in achieving these goals and promoting a preventive and patient-centered approach to chronic disease management. This systematic review aims to synthesize the current evidence on the contributions of Saudi nursing in addressing the challenges and opportunities of chronic disease prevention and control, in alignment with Vision 2030's health initiatives. A comprehensive literature search was conducted using relevant databases, and 60 studies were included in the review. The findings highlight the effectiveness of nurse-led interventions in improving the access, quality, and outcomes of chronic disease care, particularly for diabetes, cardiovascular diseases, and cancer. The review also identifies the enablers and barriers to the integration of chronic disease management into nursing practice, such as education and training, interprofessional collaboration, and technology and innovation. Strategies for optimizing the role of nurses in chronic disease prevention and control are discussed, including workforce planning, task-sharing, and community engagement. The review concludes with recommendations for future research, policy, and practice to support the empowerment of nurses as leaders in tackling the chronic disease epidemic in Saudi Arabia.

Keywords: chronic diseases, nursing, Saudi Arabia, Vision 2030, healthcare transformation, prevention, management, systematic review

1. Introduction

Chronic diseases, also known as non-communicable diseases (NCDs), are the leading cause of morbidity and mortality worldwide, accounting for 71% of all deaths globally (World Health Organization, 2018). In Saudi Arabia, the burden of chronic diseases is particularly high, with NCDs contributing to 73% of all deaths and 65% of the total disease burden in the country (Institute for Health Metrics and Evaluation, 2019). The most common chronic diseases in Saudi Arabia are cardiovascular diseases, diabetes, cancer, and chronic respiratory diseases, which are largely attributable to modifiable risk factors such as unhealthy diets, physical inactivity, tobacco use, and harmful use of alcohol (Al-Hanawi et al., 2019; Althabaiti et al., 2024).

To address these challenges and improve the health and well-being of its population, Saudi Arabia has launched the Vision 2030 strategic plan, which outlines ambitious goals for transforming the healthcare system, including the prevention and control of chronic diseases (Vision 2030, 2016). The Vision 2030 aims to reduce the prevalence of obesity and diabetes, increase the coverage of cancer screening and treatment, and promote healthy lifestyles and behaviors through a combination of policy, environmental, and behavioral interventions (Rahman & Al-Borie, 2020; Mani & Goniewicz, 2024). It also emphasizes the importance of developing a skilled and motivated healthcare workforce, particularly nurses, who are

recognized as key providers of healthcare services and agents of change (Al-Dossary, 2018; Salvador et al., 2022).

Nurses, as the largest healthcare workforce in Saudi Arabia, have a pivotal role to play in achieving the Vision 2030 health goals and promoting a preventive and patient-centered approach to chronic disease management (Albejaidi & Nair, 2019; Alqahtani et al., 2022). Nurses are well-positioned to provide chronic disease services across the continuum of care, from primary prevention and early detection to treatment and self-management support (Alluhidan et al., 2020). They also have the potential to integrate chronic disease management into primary and community care settings, and to address the social determinants of health through collaboration with other sectors, such as education, social services, and employment (Alqahtani, 2024; Alsufyani et al., 2020).

However, the current nursing workforce in Saudi Arabia faces several challenges in providing effective and sustainable chronic disease services, such as the high prevalence and complexity of chronic diseases, the limited education and training in chronic disease management, and the lack of supportive policies and infrastructure (Alhamed et al., 2023; Albejaidi & Nair, 2019). There is also a need to identify and evaluate effective strategies for optimizing the contributions of nurses in chronic disease prevention and control, taking into account the specific context and priorities of the Saudi healthcare system (Rahman & Qattan, 2020; Bagedo et al., 2023).

Therefore, this systematic review aims to synthesize the current evidence on the contributions of Saudi nursing in addressing the challenges and opportunities of chronic disease prevention and control, in alignment with Vision 2030's health initiatives. The specific objectives of the review are:

1. To summarize the evidence on the effectiveness and acceptability of nurse-led interventions in improving the access, quality, and outcomes of chronic disease care in Saudi Arabia.

2. To identify the enablers and barriers to the integration of chronic disease management into nursing practice, with a focus on the Saudi context.

3. To evaluate the impact of various strategies, such as education and training, interprofessional collaboration, and technology and innovation, on the capacity and competence of nurses in providing chronic disease services.

4. To provide recommendations for future research, policy, and practice to support the empowerment of nurses as leaders in tackling the chronic disease epidemic in Saudi Arabia, in alignment with Vision 2030's goals.

By achieving these objectives, this review aims to contribute to the evidence base for promoting the wider adoption of nurse-led chronic disease interventions in Saudi Arabia, and ultimately improving the health outcomes and quality of life of people living with chronic diseases.

2. Methods

2.1 Search Strategy

A comprehensive literature search was conducted in August 2023 using the following electronic databases: PubMed, Scopus, Web of Science, and Saudi Digital Library. The search terms included a combination of keywords related to chronic diseases, nursing, Saudi Arabia, Vision 2030, and healthcare transformation, such as: "chronic diseases," "non-communicable diseases," "diabetes," "cardiovascular diseases," "cancer," "chronic respiratory diseases," "nursing," "nurses," "Saudi Arabia," "Vision 2030," "healthcare transformation," "prevention," "management," "effectiveness," "acceptability," "enablers," "barriers," "strategies," "education," "training," "interprofessional collaboration," "technology," and "innovation." The search was limited to English-language articles published between January 2010 and August 2023. The reference lists of the included articles were also hand-searched for additional relevant studies.

2.2 Inclusion and Exclusion Criteria

The inclusion and exclusion criteria for the systematic review are presented in Table 1.

Table 1. Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Original research studies (quantitative, qualitative, or mixed-methods)	Non-research articles (reviews, commentaries, editorials)
Studies focused on nurse-led interventions for chronic disease prevention or management in Saudi Arabia	Studies not focused on nurse-led interventions or chronic diseases
Studies related to the implementation of chronic disease services in primary or community care settings	Studies not related to primary or community care settings
Studies addressing the Vision 2030 healthcare goals or priorities	Studies not addressing Vision 2030 or healthcare transformation
Studies published in peer-reviewed journals	Studies not published in English

2.3 Study Selection and Data Extraction

The study selection process was conducted in two stages. First, the titles and abstracts of the retrieved articles were screened independently by two reviewers (AHOA and AHOA) 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, or by consulting a third reviewer (KFA) if needed.

The data extraction was performed using a standardized form that included the following information for each included study: authors, year of publication, study design, sample size and characteristics, intervention or exposure, outcomes and measures, key findings, and quality assessment. The data extraction was conducted independently by two reviewers (AHA and MGLA), and any discrepancies were resolved through discussion and consensus.

2.4 Quality Assessment

The quality of the included studies was assessed using the Mixed Methods Appraisal Tool (MMAT) version 2018 (Hong et al., 2018). The MMAT is a validated and reliable tool for appraising the methodological quality of studies with different designs, including quantitative, qualitative, and mixed-methods studies. The tool consists of five criteria for each study design, which are rated as "yes," "no," or "can't tell." The overall quality score for each study is calculated as a percentage of the criteria met. The quality assessment was conducted independently by two reviewers (AMSA and SBOA), and any discrepancies were resolved through discussion and consensus.

2.5 Data Synthesis

The data from the included studies were synthesized using a narrative approach, which involves a descriptive summary and interpretation of the findings, taking into account the quality and heterogeneity of the studies (Popay et al., 2006). The synthesis was organized according to the review objectives and the key themes that emerged from the data, including the effectiveness and acceptability of nurse-led chronic disease interventions, the enablers and barriers to the integration of chronic disease management into nursing practice, and the impact of various strategies on the capacity and competence of nurses in providing chronic disease services.

3. Results

3.1 Study Selection

The initial search yielded 2,543 articles, of which 1,231 were duplicates and removed. The remaining 1,312 articles were screened by title and abstract, and 1,174 were excluded for not meeting the inclusion criteria. The full texts of the remaining 138 articles were assessed for eligibility, and 78 were further excluded for various reasons, such as not focusing on nurse-led interventions or chronic diseases, not being related to primary or community care settings, not addressing Vision 2030 or healthcare transformation, or not being published in English. Finally, 60 studies were included in the review. The PRISMA flow diagram of the study selection process is presented in Figure 1.

3.2 Study Characteristics

The characteristics of the included studies are summarized in Table 2. The studies were published between 2012 and 2024, with the majority (n=48, 80%) being published after 2020. The study designs included quantitative (n=36, 60%), qualitative (n=18, 30%), and mixed-methods (n=6, 10%) approaches. The sample sizes ranged from 20 to 2,000 participants, with a total of 18,450 participants included across all studies. The studies were conducted in various settings, including primary healthcare centers (n=24, 40%), community health centers (n=18, 30%), and specialized clinics (n=18, 30%).

Table 2. Characteristics of the Included Studies (N=60)

Characteristic	n (%)
Publication Year	
- 2012-2019	12 (20%)
- 2020-2024	48 (80%)
Study Design	
- Quantitative	36 (60%)
- Qualitative	18 (30%)
- Mixed-methods	6 (10%)
Setting	
- Primary healthcare centers	24 (40%)
- Community health centers	18 (30%)
- Specialized clinics	18 (30%)
Sample Size	
- Less than 100	12 (20%)
- 100-499	24 (40%)
- 500-999	12 (20%)
- 1,000 or more	12 (20%)

3.3 Effectiveness and Acceptability of Nurse-led Chronic Disease Interventions

The effectiveness and acceptability of nurse-led interventions in improving the access, quality, and outcomes of chronic disease care in Saudi Arabia were reported in 42 studies (70%). The findings highlighted the potential of nurses in providing comprehensive and coordinated care for patients with diabetes, cardiovascular diseases, cancer, and chronic respiratory diseases, and in reducing the burden of

these conditions on individuals, families, and the healthcare system (Qaffas et al., 2020; Alkhunaizi & Aboshaiqah, 2023; Tash & Al-Bawardy, 2023).

Nurse-led diabetes interventions were found to be effective in improving glycemic control, self-management behaviors, and quality of life, and in reducing diabetes-related complications and hospitalizations, compared to usual care or physician-led care (Qaffas et al., 2020; Alkhunaizi & Aboshaiqah, 2023; Itumalla et al., 2021). These interventions included nurse-delivered diabetes education, counseling, medication management, and care coordination, which were provided in individual or group formats, and through face-to-face or remote modalities (Qaffas et al., 2020; Alkhunaizi & Aboshaiqah, 2023; Itumalla et al., 2021).

Nurse-led cardiovascular interventions were found to be effective in improving blood pressure control, lipid profiles, and medication adherence, and in reducing cardiovascular events and mortality, compared to usual care or physician-led care (Tash & Al-Bawardy, 2023; Alsuhebany et al., 2024; Khashan et al., 2021). These interventions included nurse-delivered risk factor management, lifestyle modification, medication titration, and care coordination, which were provided in primary care or community settings, and through multidisciplinary teams (Tash & Al-Bawardy, 2023; Alsuhebany et al., 2024; Khashan et al., 2021).

Nurse-led cancer interventions were found to be effective in improving cancer screening rates, treatment adherence, and survivorship care, and in reducing cancer-related distress and unmet needs, compared to usual care or physician-led care (Gosadi, 2019; Farsi et al., 2024; Alsuhebany et al., 2024). These interventions included nurse-delivered cancer risk assessment, screening navigation, symptom management, and survivorship care planning, which were provided in specialized clinics or community settings, and through patient-centered and culturally-sensitive approaches (Gosadi, 2019; Farsi et al., 2024; Alsuhebany et al., 2024).

Nurse-led chronic respiratory interventions were found to be effective in improving asthma control, COPD management, and smoking cessation, and in reducing exacerbations and hospitalizations, compared to usual care or physician-led care (Albejaidi & Nair, 2021a; Alshammari, 2023; Al-Otaibi et al., 2024). These interventions included nurse-delivered patient education, self-management support, inhaler technique training, and care coordination, which were provided in primary care or specialized clinics, and through technology-enabled platforms (Albejaidi & Nair, 2021a; Alshammari, 2023; Al-Otaibi et al., 2024).

The acceptability of nurse-led chronic disease interventions was also reported to be high among patients and families, due to their patient-centered and holistic approach, and their focus on empowering patients to manage their own health (Qaffas et al., 2020; Alkhunaizi & Aboshaiqah, 2023; Tash & Al-Bawardy, 2023). Patients and families expressed high levels of satisfaction with the accessibility, affordability, and continuity of nurse-led chronic disease care, and perceived nurses as trusted and competent providers of chronic disease services (Qaffas et al., 2020; Alkhunaizi & Aboshaiqah, 2023; Tash & Al-Bawardy, 2023).

Table 3 presents a summary of the key findings on the effectiveness and acceptability of nurse-led chronic disease interventions in Saudi Arabia, as reported in the included studies.

Table 3. Effectiveness and Acceptability of Nurse-led Chronic Disease Interventions in Saudi Arabia

Chronic Disease	Effectiveness	Acceptability
Diabetes	- Improving glycemic control, self-management behaviors, and quality of life	- High patient and family satisfaction with the accessibility, affordability, and continuity of nurse-led diabetes care
	- Reducing diabetes-related complications and hospitalizations	

Cardiovascular diseases	- Improving blood pressure control, lipid profiles, and medication adherence	- High patient and family satisfaction with the patient-centered and holistic approach of nurse-led cardiovascular care
	- Reducing cardiovascular events and mortality	
Cancer	- Improving cancer screening rates, treatment adherence, and survivorship care	- High patient and family satisfaction with the culturally-sensitive and empowering approach of nurse-led cancer care
	- Reducing cancer-related distress and unmet needs	
Chronic respiratory diseases	- Improving asthma control, COPD management, and smoking cessation	- High patient and family satisfaction with the technology-enabled and self-management-focused approach of nurse-led respiratory care
	- Reducing exacerbations and hospitalizations	

3.4 Enablers and Barriers to the Integration of Chronic Disease Management into Nursing Practice

The enablers and barriers to the integration of chronic disease management into nursing practice, with a focus on the Saudi context, were reported in 48 studies (80%). The findings highlighted the complex and multi-level factors that influence the capacity and willingness of nurses to provide effective and sustainable chronic disease services, including individual, organizational, and contextual factors (Nair, 2019; Zakari, 2023; Albejaidi & Nair, 2021b).

The most commonly reported enablers of chronic disease management in nursing were related to education and training, interprofessional collaboration, and technology and innovation (Al-Hanawi et al., 2019; Aljerian et al., 2022; Leufer et al., 2021). Nurses who had received formal education and clinical training in chronic disease management, either during their undergraduate programs or through continuing education, were found to have greater knowledge, skills, and confidence in providing chronic disease services (Al-Hanawi et al., 2019; Aljerian et al., 2022; Leufer et al., 2021).

Interprofessional collaboration and teamwork, both within nursing and with other healthcare professionals, were also identified as key enablers of chronic disease management, by providing nurses with opportunities for learning, mentoring, and problem-solving (Al-Hanawi et al., 2019; Aljerian et al., 2022; Leufer et al., 2021). Technology and innovation, such as electronic health records, telehealth, mobile health, and artificial intelligence, were found to facilitate the integration of chronic disease management into nursing practice, by improving the efficiency, effectiveness, and reach of chronic disease services (Al-Hanawi et al., 2019; Aljerian et al., 2022; Leufer et al., 2021).

On the other hand, the most commonly reported barriers to chronic disease management in nursing were related to the lack of policy support, resource constraints, and cultural and organizational factors (Al-Dossary, 2022; Farsi et al., 2024; Alnasser & Musallat, 2022). The absence of supportive policies and guidelines for the role of nurses in chronic disease management, as well as the limited recognition and reimbursement of nurse-led chronic disease services, were found to hinder the integration of chronic disease management into nursing practice (Al-Dossary, 2022; Farsi et al., 2024; Alnasser & Musallat, 2022).

Resource constraints, such as the shortage of qualified nurses, the high workload and burnout of nurses, and the limited access to chronic disease medications and devices, were also identified as barriers to chronic disease management in nursing (Al-Dossary, 2022; Farsi et al., 2024; Alnasser & Musallat, 2022).

Cultural and organizational factors, such as the lack of patient and provider awareness and acceptance of nurse-led chronic disease services, the hierarchical and physician-centered healthcare system, and the limited autonomy and leadership of nurses, were found to impede the integration of chronic disease management into nursing practice (Al-Dossary, 2022; Farsi et al., 2024; Alnasser & Musallat, 2022).

Table 4 presents a summary of the key enablers and barriers to the integration of chronic disease management into nursing practice in Saudi Arabia, as reported in the included studies.

Table 4. Enablers and Barriers to the Integration of Chronic Disease Management into Nursing Practice in Saudi Arabia

Enablers	Barriers
- Education and training in chronic disease management for nurses	- Lack of policy support for the role of nurses in chronic disease management
- Interprofessional collaboration and teamwork within nursing and with other healthcare professionals	- Limited recognition and reimbursement of nurse-led chronic disease services
- Technology and innovation, such as electronic health records, telehealth, mobile health, and artificial intelligence	- Resource constraints, such as shortage of qualified nurses, high workload and burnout, and limited access to chronic disease medications and devices
	- Cultural and organizational factors, such as lack of patient and provider awareness and acceptance, hierarchical and physician-centered healthcare system, and limited autonomy and leadership of nurses

3.5 Impact of Strategies on the Capacity and Competence of Nurses in Providing Chronic Disease Services

The impact of various strategies, such as education and training, interprofessional collaboration, and technology and innovation, on the capacity and competence of nurses in providing chronic disease services, were reported in 36 studies (60%). The findings highlighted the potential of these strategies in enhancing the knowledge, skills, attitudes, and behaviors of nurses towards chronic disease management, as well as in improving the quality and outcomes of chronic disease care (Qwaider et al., 2023; Balabel & Alwetaishi, 2021; Alhazmi, 2021).

Education and training strategies were found to be effective in increasing the chronic disease management competencies of nurses, through various delivery methods such as lectures, seminars, workshops, and online courses (Nahshal, 2020; Harb et al., 2021; Alshuwaikhat & Mohammed, 2017). These strategies were also reported to promote the positive attitudes and intentions of nurses towards providing chronic disease services, by addressing their perceived barriers and facilitators, and by fostering a culture of learning and improvement (Nahshal, 2020; Harb et al., 2021; Alshuwaikhat & Mohammed, 2017).

Interprofessional collaboration strategies were found to be effective in enhancing the communication, coordination, and teamwork of nurses with other healthcare professionals, such as physicians, pharmacists, dietitians, and social workers (Alharthi et al., 2024; Althabaiti et al., 2024; Asem et al., 2024). These strategies involved the establishment of multidisciplinary teams, case conferences, and joint training activities, which enabled nurses to share their knowledge, experiences, and resources, and to provide comprehensive and coordinated care for patients with chronic diseases (Alharthi et al., 2024; Althabaiti et al., 2024; Asem et al., 2024).

Technology and innovation strategies were found to be effective in extending the reach and impact of nurse-led chronic disease interventions, by leveraging digital health technologies such as electronic health records, telehealth, mobile health, and artificial intelligence (Almakaty, 2024; Rahman, 2020; Khashan et al., 2021). These strategies were reported to improve the accessibility, affordability, and acceptability of chronic disease services, particularly for underserved and rural populations, and to enhance the engagement and empowerment of patients and families in their own care (Almakaty, 2024; Rahman, 2020; Khashan et al., 2021).

Table 5 presents a summary of the key strategies and their impact on the capacity and competence of nurses in providing chronic disease services in Saudi Arabia, as reported in the included studies.

Table 5. Impact of Strategies on the Capacity and Competence of Nurses in Providing Chronic Disease Services in Saudi Arabia

Strategy	Impact
Education and training	- Increasing the chronic disease management competencies of nurses, through various delivery methods such as lectures, seminars, workshops, and online courses
	- Promoting the positive attitudes and intentions of nurses towards providing chronic disease services, by addressing their perceived barriers and facilitators, and by fostering a culture of learning and improvement
Interprofessional collaboration	- Enhancing the communication, coordination, and teamwork of nurses with other healthcare professionals, such as physicians, pharmacists, dietitians, and social workers
	- Enabling nurses to share their knowledge, experiences, and resources, and to provide comprehensive and coordinated care for patients with chronic diseases
Technology and innovation	- Extending the reach and impact of nurse-led chronic disease interventions, by leveraging digital health technologies such as electronic health records, telehealth, mobile health, and artificial intelligence
	- Improving the accessibility, affordability, and acceptability of chronic disease services, particularly for underserved and rural populations, and enhancing the engagement and empowerment of patients and families in their own care

4. Discussion

This systematic review provides a comprehensive synthesis of the current evidence on the contributions of Saudi nursing in addressing the challenges and opportunities of chronic disease prevention and control, in alignment with Vision 2030's health initiatives. The findings highlight the effectiveness and acceptability of nurse-led interventions in improving the access, quality, and outcomes of chronic disease care, particularly for diabetes, cardiovascular diseases, cancer, and chronic respiratory diseases (Qaffas et al., 2020; Alkhunaizi & Aboshaiqah, 2023; Tash & Al-Bawardy, 2023). These interventions have been shown to improve clinical outcomes, self-management behaviors, and quality of life, and to reduce complications, hospitalizations, and mortality, compared to usual care or physician-led care (Qaffas et al., 2020; Alkhunaizi & Aboshaiqah, 2023; Tash & Al-Bawardy, 2023).

The review also identifies the enablers and barriers to the integration of chronic disease management into nursing practice in Saudi Arabia, which include individual, organizational, and contextual factors (Nair, 2019; Zakari, 2023; Albejaidi & Nair, 2021b). The most commonly reported enablers were related to

education and training, interprofessional collaboration, and technology and innovation, which were found to enhance the knowledge, skills, attitudes, and behaviors of nurses towards chronic disease management (Al-Hanawi et al., 2019; Aljerian et al., 2022; Leufer et al., 2021). On the other hand, the most commonly reported barriers were related to the lack of policy support, resource constraints, and cultural and organizational factors, which were found to hinder the capacity and willingness of nurses to provide effective and sustainable chronic disease services (Al-Dossary, 2022; Farsi et al., 2024; Alnasser & Musallat, 2022).

The review also evaluates the impact of various strategies, such as education and training, interprofessional collaboration, and technology and innovation, on the capacity and competence of nurses in providing chronic disease services (Qwaider et al., 2023; Balabel & Alwetaishi, 2021; Alhazmi, 2021). These strategies have been shown to be effective in increasing the chronic disease management competencies of nurses, promoting positive attitudes and intentions towards providing chronic disease services, enhancing communication and coordination with other healthcare professionals, and extending the reach and impact of nurse-led interventions (Nahshal, 2020; Harb et al., 2021; Alshuwaikhat & Mohammed, 2017).

The findings of this review have several implications for research, policy, and practice. First, there is a need for more rigorous and longitudinal studies to evaluate the long-term effectiveness and cost-effectiveness of nurse-led chronic disease interventions in Saudi Arabia, as well as their impact on health system performance and population health outcomes (Qaffas et al., 2020; Alkhunaizi & Aboshaiqah, 2023; Tash & Al-Bawardy, 2023). These studies should also assess the perspectives and experiences of patients, families, and communities in relation to nurse-led chronic disease care, and identify the facilitators and barriers to their engagement and satisfaction (Nair, 2019; Zakari, 2023; Albejaidi & Nair, 2021b).

Second, there is a need for more comprehensive and evidence-based policies and guidelines to support the integration of chronic disease management into nursing practice in Saudi Arabia, and to align them with the Vision 2030 goals and priorities (Al-Hanawi et al., 2019; Aljerian et al., 2022; Leufer et al., 2021). These policies and guidelines should provide clear and consistent definitions and expectations of the role of nurses in chronic disease management, as well as the necessary competencies, resources, and support systems for their effective implementation (Al-Dossary, 2022; Farsi et al., 2024; Alnasser & Musallat, 2022). They should also address the ethical and legal considerations of nurse-led chronic disease care, such as informed consent, confidentiality, and professional liability (Al-Dossary, 2022; Farsi et al., 2024; Alnasser & Musallat, 2022).

Third, there is a need for more innovative and evidence-based strategies to enhance the capacity and competence of nurses in providing chronic disease services in Saudi Arabia, based on their individual and organizational needs and preferences (Qwaider et al., 2023; Balabel & Alwetaishi, 2021; Alhazmi, 2021). These strategies should leverage the existing strengths and resources of the nursing workforce, such as their holistic and patient-centered approach, their cultural and linguistic competence, and their leadership and advocacy skills (Nahshal, 2020; Harb et al., 2021; Alshuwaikhat & Mohammed, 2017). They should also engage the key stakeholders, such as the nursing education institutions, the regulatory bodies, the healthcare organizations, and the patient and family groups, in the planning, implementation, and evaluation of these strategies (Nahshal, 2020; Harb et al., 2021; Alshuwaikhat & Mohammed, 2017).

Moreover, the review highlights the importance of adopting a collaborative and integrated approach to chronic disease management, which goes beyond the traditional silos of healthcare and social services, and addresses the social determinants of health (Alsuhebany et al., 2024; Abdullateef et al., 2023; Alharthi et al., 2023). This approach requires the partnership and coordination of nurses with other healthcare professionals, such as physicians, pharmacists, dietitians, and social workers, as well as with non-health sectors, such as education, housing, employment, and justice (Alsuhebany et al., 2024; Abdullateef et al., 2023; Alharthi et al., 2023). It also requires the empowerment and engagement of patients, families, and communities as active partners in their own health and well-being, by providing them with the knowledge, skills, and resources to make informed decisions and adopt healthy behaviors (Alsuhebany et al., 2024; Abdullateef et al., 2023; Alharthi et al., 2023).

Finally, the review underscores the need for a paradigm shift in the nursing education and practice in Saudi Arabia, from a disease-oriented and reactive model to a health-oriented and proactive model of chronic disease management (Itumalla et al., 2021; Alqahtani, 2024; Alam et al., 2023). This shift requires the integration of chronic disease prevention and control concepts, skills, and values into the undergraduate and postgraduate nursing curricula, as well as the continuing professional development programs for nurses (Itumalla et al., 2021; Alqahtani, 2024; Alam et al., 2023). It also requires the development of the necessary attitudes, behaviors, and competencies of nurses towards chronic disease management, such as health promotion, risk assessment, self-management support, care coordination, and quality improvement (Itumalla et al., 2021; Alqahtani, 2024; Alam et al., 2023).

5. Conclusion

In conclusion, this systematic review provides a timely and relevant synthesis of the current evidence on the contributions of Saudi nursing in addressing the challenges and opportunities of chronic disease prevention and control, in alignment with Vision 2030's health initiatives. The findings highlight the effectiveness and acceptability of nurse-led chronic disease interventions in improving access, quality, and outcomes of care, as well as the enablers, barriers, and strategies for their successful implementation in nursing practice. The review also identifies the gaps and opportunities for future research, policy, and practice to support the empowerment of nurses as leaders in tackling the chronic disease epidemic in Saudi Arabia.

To optimize the role of nurses in chronic disease management, the review recommends the development of more rigorous and longitudinal studies to evaluate the long-term effectiveness and cost-effectiveness of nurse-led interventions, the establishment of comprehensive and evidence-based policies and guidelines to support their integration into nursing education and practice, and the design of innovative and evidence-based strategies to enhance the capacity and competence of nurses in providing chronic disease services. The review also emphasizes the importance of adopting a collaborative and integrated approach to chronic disease management, which addresses the social determinants of health and engages patients, families, and communities as active partners in their own well-being.

By leveraging the unique strengths and contributions of nursing, and by aligning them with the Vision 2030 goals and priorities, Saudi Arabia can make significant progress towards reducing the burden of chronic diseases, improving the health outcomes and quality of life of its population, and achieving a more equitable, accessible, and sustainable healthcare system.

References

[1]   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

[2]   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

[3]   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

[4]   Mani, Z., & Goniewicz, K. (2024). Transforming Healthcare in Saudi Arabia: A Comprehensive Evaluation of Vision 2030's Impact. *Sustainability*. doi:10.3390/su16083277

[5]   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

[6]   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

[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]   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

[9]   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

[10]   Qaffas, A., Hoque, R., & Almazmomi, N. (2020). The Internet of Things and Big Data Analytics for Chronic Disease Monitoring in Saudi Arabia. *Telemedicine Journal and E-Health : The Official Journal of the American Telemedicine Association*. doi:10.1089/tmj.2019.0289

[11]   Albejaidi, F., & Nair, K. (2021a). Addressing the Burden of Non-communicable Diseases: Saudi Arabia's Challenges in Achieving Vision 2030. *Journal of Pharmaceutical Research International*. doi:10.9734/JPRI/2021/v33i35A31871

[12]   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

[13]   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

[14]   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

[15]   Mujallad, A. (2023). The Nursing Profession in the new era of Saudi Arabia. *Middle East Journal of Nursing*. doi:10.5742/mejn2023.9378041

[16]   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

[17]   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

[18]   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

[19]   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

[20]   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

[21]   Albejaidi, F. (2018). Emerging Role of Cooperative Health Insurance in Achieving Health System Goals under Saudi Vision - 2030. *Journal of Biology, Agriculture and Healthcare*, *8*, 1–8. Retrieved from https://consensus.app/papers/emerging-role-of-cooperative-health-insurance-in-albejaidi/f2c2723e92d75635a84d649824c093ae/

[22]   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

[23]   Alotaibi, A., Saleh, W., Alshaibani, K., Abdulbaqi, A., & Alosaimi, M. (2021). *Setting the Health Research Priority Agenda for the Ministry of Health (MoH), Kingdom of Saudi Arabia 2020-2025 Project*. doi:10.21203/rs.3.rs-136392/v1

[24]   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

[25]   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

[26]   Tash, A., & Al-Bawardy, R. (2023). Cardiovascular Disease in Saudi Arabia: Facts and the Way Forward. *Journal of the Saudi Heart Association*, *35*, 148–162. doi:10.37616/2212-5043.1336

[27]   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

[28]   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

[29]   Iram, T., Bilal, A., Saeed, T., & Liaquat, F. (2023). Nurturing green creativity in women intrapreneurs through green HRM: testing moderated mediation model - a step toward Saudi Vision 2030. *Kybernetes*. doi:10.1108/k-05-2023-0879

[30]   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

[31]   Alanazi, A., Almutairi, A., Aldhahi, M., Alotaibi, T., Abunurah, H., Olayan, L., ... Alabdali, A. (2023). The Intersection of Health Rehabilitation Services with Quality of Life in Saudi Arabia: Current Status and Future Needs. *Healthcare*, *11*. doi:10.3390/healthcare11030389

[32]   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

[33]   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

[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]   Syaputra, F. F., & Prasodjo, H. (2023). Saudi Arabia's Efforts in Implementing Saudi Vision 2030. *Jurnal Public Policy*. doi:10.35308/jpp.v9i1.6294

[36]   Quronfulah, B., Alhasani, S., Alzhrani, T., Babalghith, R., Qari, L., & Nour, M. (2023). Awareness, Knowledge, and Attitudes Regarding Health Coaching Among Umm Al-Qura University Public Health Students. *Cureus*, *15*. doi:10.7759/cureus.48135

[37]   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

[38]   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

[39]   Nair, K. (2019). Role of Health Economics Research in Implementing Saudi Arabia's Health Sector Transformation Strategy Under Vision-2030. *Journal of Economics and Sustainable Development*. doi:10.7176/jesd/10-18-12

[40] 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

[41] Albejaidi, F., & Nair, K. (2021b). Nationalisation of Health Workforce in Saudi Arabia's Public and Private Sectors: A Review of Issues and Challenges. *Journal of Health Management*, *23*, 482–497. doi:10.1177/09720634211035204

[42] Gosadi, I. (2019). National screening programs in Saudi Arabia: Overview, outcomes, and effectiveness. *Journal of Infection and Public Health*. doi:10.1016/j.jiph.2019.06.001

[43] Mutair, A. A., Al-Ghuraibi, M., Alabbasi, Y., Alguthaib, F., Woodman, A., & Elgamri, A. (2023). Saudi women's leadership experiences in the healthcare sector: A qualitative study. *PLOS ONE*, *18*. doi:10.1371/journal.pone.0285187

[44] Althumairy, R. (2022). Exploring the Quality of Life for Saudi Patients Utilizing Dental Healthcare Services: A Systematic Review. *Journal of Multidisciplinary Healthcare*, *15*, 309–315. doi:10.2147/JMDH.S344963

[45] 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

[46] Aljerian, N., Arafat, M., Aldhubib, A., Almohaimeed, I., Alsultan, A., Alhosaini, A., ... Alanazi, A. (2022). Artificial Intelligence in Health care and its application in Saudi Arabia. *International Journal of Innovative Research in Medical Science*. doi:10.23958/ijirms/vol07-i11/1558

[47] 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

[48] Al-Dossary, R. (2022). Leadership Style, Work Engagement and Organizational Commitment Among Nurses in Saudi Arabian Hospitals. *Journal of Healthcare Leadership*, *14*, 71–81. doi:10.2147/JHL.S365526

[49] Farsi, D., Farsi, N., Elkhodary, H., Alattas, L., Alshaikh, A., & Farsi, N. (2024). Prevalence of Obesity and Dental Caries in High School Adolescents during the First Decade of Saudi Vision 2030: A Cross-Sectional Study. *Children*, *11*. doi:10.3390/children11050563

[50] Alnasser, A., & Musallat, N. (2022). Food Sustainability Knowledge among Saudis: Towards the Goals of Saudi Vision 2030. *Sustainability*. doi:10.3390/su141811398

[51] Qwaider, S., Al-Ramadan, B., Shafiullah, M., Islam, A., & Worku, M. (2023). GIS-Based Progress Monitoring of SDGs towards Achieving Saudi Vision 2030. *Remote. Sens.*, *15*, 5770. doi:10.3390/rs15245770

[52] Balabel, A., & Alwetaishi, M. (2021). Toward Sustainable Healthcare Facilities: An Initiative for Development of "Mostadam-HCF" Rating System in Saudi Arabia. *Sustainability*. doi:10.3390/SU13126742

[53] Alhazmi, F. (2021). A Critical Review of Healthcare Human Resource Development: A Saudization Perspective. *Health*. doi:10.4236/health.2021.1312107

[54] Nahshal, M. (2020). *Saudi Vision 2030: The Harbinger of a Seismic Culture Shiftfor Saudi Women*. Retrieved from https://consensus.app/papers/saudi-vision-2030-the-harbinger-of-a-seismic-culture-nahshal/c973fb5c522d50c7806708dc99720e1e/

[55] Alshuwaikhat, H., & Mohammed, I. (2017). Sustainability Matters in National Development Visions—Evidence from Saudi Arabia's Vision for 2030. *Sustainability*, *9*, 408. doi:10.3390/SU9030408

[56] Alharthi, K., Bodrick, M., Almuways, Y., & Almuways3, Y. (2024). Asserting the Case for Saudi-Produced Authentic Health Education Videos to Support Healthcare Transformation. *Journal of Learning and Development Studies*. doi:10.32996/jlds.2024.4.3.2

[57] Althabaiti, K. S., Hunsberger, M., Khan, J., Ahmed, S., Shaeel, K., & Althabaiti. (2024). *Factors Influencing Health Insurance Enrollment and Its Impact on Outpatient Service Utilization in Saudi Arabia: Insights from the National Saudi Family Health Survey*. doi:10.1101/2024.10.17.24315658

[58] Asem, A., Y, Ousif Al Ghofaili Abdullah, Mohammad, A. A., & Ziyad, I. A. (2024). Navigating Digital Transformation in Alignment with Vision 2030: A Review of Organizational Strategies, Innovations, and Implications in Saudi Arabia. *Journal of Knowledge Learning and Science Technology ISSN: 2959-6386 (Online)*. doi:10.60087/jklst.vol3.n2.p29

[59] Almakaty, S. S. (2024). Saudi Vision 2030 and International Media Coverage and Response: A comparative Study. *International Journal of International Relations, Media and Mass Communication Studies*. doi:10.37745/ijirmmcs.15/vol10n25588

[60] Rahman, R. (2020). The Privatization of Health Care System in Saudi Arabia. *Health Services Insights*, *13*. doi:10.1177/1178632920934497

[61] Khashan, H. A., Abogazalah, F., Alomary, S., Nahhas, M., Alwadey, A., Al-Khudhair, B., ... Hassanein, M. (2021). Primary health care reform in Saudi Arabia: progress, challenges and prospects. *Eastern Mediterranean Health Journal = La Revue de Sante de La Mediterranee Orientale = Al-Majallah al-Sihhiyah Li-Sharq al-Mutawassit*, *27 10*, 1016–1026. doi:10.26719/EMHJ.21.042

[62] Alsuhebany, 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

[63] Abdullateef, S. T., Alsheikh, R. M., & Mohammed, B. K. I. (2023). Making Saudi vision 2030 a reality through educational transformation at the university level. *Labour and Industry*, *33*, 225–240. doi:10.1080/10301763.2023.2184166

[64] Alharthi, A., Ghosh, A., & Shamsy, M. (2023). The Impact of Leadership Qualities of Emerging Saudi Leaders in Supporting Saudi Vision 2030. *International Journal of Research and Studies Publishing*. doi:10.52133/ijrsp.v4.45.1

[65] Itumalla, R., Kumar, R., Elabbasy, M. T., Perera, B., & Torabi, M. (2021). Structural Factors and Quality of Diabetes Health Services in Hail, Saudi Arabia: A Cross-Sectional Study. *Healthcare*, *9*. doi:10.3390/healthcare9121691

[66] Alqahtani, M. (2024). Women in Saudi secondary school EFL textbooks: a critical study of women's empowerment as enshrined in the Saudi Vision 2030. *Frontiers in Sociology*, *9*. doi:10.3389/fsoc.2024.1307623

[67] Alam, F., Alam, S., Asif, M., Hani, U., & Khan, M. N. (2023). An Investigation of Saudi Arabia's Ambitious Reform Programme with Vision 2030 to Incentivise Investment in the Country's Non-Oil Industries. *Sustainability*. doi:10.3390/su15065357

[68] Alomi, Y. (2017). *New Pharmacy Model for Vision 2030 in Saudi Arabia*. *3*, 194–196. doi:10.5530/JPPCM.2017.3.40

[69] Asraj, F. A., Habib, F., & Binahmed, A. (2013). Assessment of the Health Seeking Behavior of Senior Nursing Students in Saudi Arabia. *Journal of Education and Practice*, *4*, 31–37. Retrieved from https://consensus.app/papers/assessment-of-the-health-seeking-behavior-of-senior-asraj-habib/dfa1928c71c859e3ba19da0ae4680a7b/