

# Nurses' Perspectives on the Integration of Preventative Care Models in Saudi Arabian Primary Healthcare

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## Abstract

Preventative care models have been increasingly adopted in primary healthcare settings worldwide to proactively prevent disease and promote population health. In Saudi Arabia, the integration of preventative services into primary care is still an emerging practice. This qualitative study explored the perspectives of primary care nurses in Saudi Arabia regarding the facilitators, barriers, and impacts of integrating preventative care models into their practice. Semi-structured interviews were conducted with a purposive sample of 20 nurses from primary healthcare centers across three regions of Saudi Arabia. Thematic analysis revealed four main themes: 1) Perceived benefits of preventative care, 2) Challenges with preventative care delivery, 3) Factors enabling preventative care, and 4) Recommendations to enhance preventative services. Nurses strongly believed in the importance and positive impacts of providing preventative care but cited issues like time constraints, staffing shortages, lack of training, and low patient awareness as key barriers. Strong leadership support, dedicated preventative care appointments, improved technology systems, and patient education were identified as crucial facilitators. The findings highlight the need for organizational changes and support to enhance the capacity of the primary care nursing workforce to successfully implement preventative care models in Saudi Arabia. Integrating nurses' perspectives in the design of preventative services can help optimize delivery and improve population health outcomes.

**Keywords:** preventative care, primary healthcare, nursing, Saudi Arabia, qualitative research

## Introduction

Preventative healthcare has gained increasing prominence in recent years as health systems worldwide shift focus from treating disease to promoting health and wellbeing. Preventative care aims to proactively prevent the onset of disease or detect it early to enable prompt intervention and reduce disease burden (Goldston, 2020). Common preventative services include health screenings, immunizations, health education, and wellness counseling. When effectively implemented, preventative care can improve population health outcomes, enhance quality of life, and reduce healthcare costs associated with treating advanced disease (Levine et al., 2021).

Primary healthcare settings serve as ideal venues for delivering preventative services given their role as the first point of contact and main source of continuous, comprehensive care for patients (Meireles et al., 2020). Many countries have made concerted efforts to reorient their primary care systems to prioritize preventative care delivery. In the United States, the Affordable Care Act expanded insurance coverage for recommended preventative services (Rosenbaum, 2020). The United Kingdom's National Health Service has set a strategic priority to embed prevention in all frontline health services, supported by dedicated funding (Public Health England, 2019).

Saudi Arabia has also recognized the pressing need to strengthen primary healthcare and prioritize preventative care amidst rising rates of non-communicable diseases like diabetes, hypertension, and heart disease (Tyrovolas et al., 2020). The Saudi Ministry of Health has launched several reforms and initiatives in recent years to restructure the primary care system and scale up preventative services (Alharbi, 2018). However, shifting from a historically treatment-focused model to one with a strong emphasis on prevention requires major changes not only to healthcare delivery systems but also to the knowledge, skills, and practices of frontline care providers.

As the largest segment of the healthcare workforce with the most frequent patient interactions, nurses play a pivotal role in implementing preventative care (Issel, 2021). Prior research has shown that nurses are generally supportive of providing preventative services but face various challenges in integrating prevention into routine practice (Walker et al., 2020). However, there is limited research examining the specific experiences and perspectives of primary care nurses regarding preventative care delivery in Saudi Arabia and other Arab countries.

Gathering the insights of frontline nurses is crucial for identifying facilitators and barriers to providing preventative services in order to develop targeted interventions to enhance implementation. Therefore, the purpose of this

qualitative study was to explore Saudi Arabian primary care nurses' perspectives on the integration of preventative care models in their setting. The study aimed to elicit nurses' views on the importance and impacts of preventative care, challenges faced in providing preventative services, enabling factors that support preventative care delivery, and recommendations to strengthen preventative care in the Saudi primary healthcare context.

#### Literature Review

##### The Importance of Preventative Care

A robust body of evidence has demonstrated the significant benefits of preventative healthcare for improving population health outcomes and reducing disease burden. A systematic review by Levine et al. (2021) found that preventative interventions such as health screenings, vaccinations, health education, and behavioral counseling can effectively reduce morbidity and mortality from various chronic diseases including cardiovascular disease, diabetes, and cancer. Maciosek et al. (2017) estimated that increasing the use of evidence-based preventative services in the U.S. to 90% could save over 200,000 lives annually. Studies have also shown preventative care to be highly cost-effective, with every \$1 invested yielding up to \$10 in healthcare savings (Goldston, 2020).

Preventative care encompasses primary, secondary, and tertiary prevention aimed at different stages of health and disease (Pandve, 2020). Primary prevention focuses on avoiding the development of disease in healthy individuals through interventions like immunizations, health education, and wellness counseling. Secondary prevention involves screening to detect disease in its earliest stages before symptoms appear in order to enable prompt treatment and improve prognosis. Tertiary prevention targets individuals already diagnosed with disease to prevent complications, slow disease progression, and optimize quality of life. A comprehensive preventative care approach incorporates all three levels of prevention in a continuous, coordinated manner across the care continuum.

Despite the proven value of preventative care, many health systems worldwide have historically focused more heavily on treating rather than preventing disease. Fee-for-service reimbursement models incentivizing the volume of treatment services, lack of time and resources for preventative care, and limited training in prevention among healthcare providers have posed barriers to optimal preventative service delivery (Meireles et al., 2020). However, in light of aging populations and the rising global burden of chronic disease, a paradigm shift toward prevention is now recognized as imperative. Delivering preventative care in primary care settings is especially critical, as it enables wide population reach, early risk identification, and continuity of preventative interventions.

##### The Nursing Role in Preventative Care

Nurses serve an integral role in providing front-line preventative care across healthcare settings. With their holistic, patient-centered approach and frequent interactions with patients and families, nurses are ideally positioned to provide preventative services and promote healthy behaviors (Issel, 2021). Nurses often serve as the first point of contact for patients in primary care, conduct health assessments and screenings, provide health education and behavioral counseling, administer vaccinations, and coordinate preventative care plans. Studies have shown that nurse-led preventative interventions can effectively improve various health outcomes including increased cancer screening and immunization rates, better chronic disease management, and enhanced healthy lifestyle behaviors (Walker et al., 2020).

Kemppainen et al. (2018) conducted a systematic review on nurses' roles in providing health promotion and prevention interventions across primary care settings. The most common preventative practices performed by nurses include patient education to enhance health literacy and promote behavior change, screening for cardiovascular risk factors and chronic diseases, counseling on healthy lifestyle factors such as diet, exercise, and smoking cessation, administering and promoting preventative medications and immunizations, and collaborating with the multidisciplinary care team to implement preventative care plans. The authors found that nurse-led preventative interventions resulted in improved health outcomes, risk factor control, and patient satisfaction.

However, research has also identified various challenges hindering nurses' integration of preventative care into routine practice. A qualitative study of public health nurses' preventative practices in Finland found that lack of time, staff shortages, insufficient training, and poor technological support systems posed barriers to optimal preventative service delivery (Maijala et al., 2018). Another qualitative study in the UK revealed that primary care nurses felt they lacked adequate knowledge and skills to provide behavioral counseling and lifestyle advice beyond the traditional focus on medical aspects of care (Boase et al., 2012). Quantitative studies have also found gaps between nurses' perceived importance of preventative care and their actual engagement in preventative practices (Issel, 2021).

To enable nurses to fully harness their potential in preventative care, it is crucial to better understand their perspectives on current preventative practices, facilitators and barriers to providing preventative services, and opportunities to strengthen prevention in the primary care context. However, there remains limited research exploring frontline nurses' experiences with integrating preventative care models, especially in non-Western contexts. Examining the perspectives of primary care nurses in Saudi Arabia, where the preventative care agenda is

still nascent, is especially needed to guide context-specific interventions to enhance prevention and improve population health.

#### Preventative Care in Saudi Arabian Primary Healthcare

Saudi Arabia, like many countries globally, is grappling with the rising prevalence of chronic non-communicable diseases posing significant health and economic burdens. The Saudi Health Interview Survey revealed that 14.8% of adults had hypertension, 13.4% had diabetes, and 28.7% were obese (Al-Rubeaan, 2019). Unhealthy lifestyle factors such as physical inactivity, poor diet, and smoking have been identified as key contributors to chronic disease in the Saudi population (Tyrovolas et al., 2020). In light of this, the Saudi Ministry of Health has prioritized strengthening preventative care in primary healthcare as a key strategic goal.

In 2016, Saudi Arabia initiated a major reformation of its primary healthcare system, known as the Saudi Healthcare Transformation Strategy (Al-Hanawi, 2017). A core aim was to shift from a historically curative, hospital-centric model toward a preventive and community-based approach. Specific initiatives have included establishing dedicated preventative care clinics within primary healthcare centers, expanding screening programs for non-communicable diseases, implementing electronic health records with clinical decision support for preventative services, and providing training for healthcare staff on prevention (Al-Hanawi, 2017).

Studies have started to emerge examining the evolving state of preventative care in Saudi primary health centers after the reform. A cross-sectional study by Al-Wadaani & Al-Bhairi (2020) assessed the availability of clinical preventative services in primary care centers in Al-Jouf province. While child vaccination services were widely available, major gaps were identified in the provision of adult preventative services such as diabetes and cancer screenings, demonstrating the need for further scale-up of prevention targeting non-communicable diseases.

Aljasir & Alghamdi (2010) conducted a study on primary care physicians' practices and perceived barriers regarding preventative care delivery in Riyadh. Physicians considered preventative services important but cited short consultation times, lack of patient interest, and inadequate reimbursement as key obstacles. The perspectives of primary care nurses were not examined. Another quantitative study by Al-Khaldi et al. (2017) in Aseer province found that primary care physicians had poor adherence to preventative care guidelines, especially for counseling and health education services.

While these studies provide useful insights on the state of preventative care in Saudi primary health centers, in-depth exploration of frontline healthcare providers' perspectives remains scarce, especially among the nursing workforce. Qualitative research is needed to contextualize the unique experiences, challenges, and enablers that nurses perceive in integrating preventative services into primary care practice. Eliciting nurses' insights is crucial for tailoring approaches to enhance their capacity and optimize preventative care delivery to achieve the prevention goals of Saudi Arabia's primary healthcare transformation.

#### Methods

##### Study Design

A qualitative descriptive design with semi-structured individual interviews was used to explore Saudi primary care nurses' perspectives on the integration of preventative care models in their setting. Qualitative description is suitable when the goal is to obtain a rich, straightforward description of a phenomenon (Bradshaw et al., 2017). Interviews allow in-depth exploration of participants' experiences, perceptions, and insights on the topic of inquiry (DeJonckheere & Vaughn, 2019). The semi-structured approach provides a guiding framework while allowing flexibility to probe interesting lines of inquiry that arise. The study was positioned within a pragmatic research paradigm, which focuses on using the most appropriate methods to answer a research question with practical implications (Kaushik & Walsh, 2019).

##### Participants and Sampling

Purposive sampling was used to recruit Saudi nurses currently working in primary healthcare settings and involved in delivering preventative services. Maximum variation sampling, a purposive sampling strategy that aims to capture a wide range of perspectives, was employed with the goal of including nurses from different geographic regions, genders, age groups, nursing roles, and years of experience (Palinkas et al., 2015). Inclusion criteria were: 1) Licensed nurse in Saudi Arabia, 2) Currently practicing in a primary healthcare center for at least 1 year, 3) Involvement in delivering preventative care services, 4) Arabic or English speaking. A target sample size of 20 nurses was set based on guidance that 20-30 interviews are usually sufficient to achieve data saturation in qualitative descriptive studies (Hennink et al., 2017).

Recruitment occurred through the Ministry of Health's regional nursing offices. An introductory email with study information was sent to nursing directors to forward to eligible nurses in their primary care facilities. Interested nurses contacted the researchers to have their questions answered, provide informed consent, and schedule interviews. Recruitment continued until the target sample size was reached.

### Data Collection

Individual interviews were conducted between January-March 2022 via telephone or video-conferencing based on the participant's preference. A semi-structured interview guide (Table 1) with open-ended questions and probes was used to elicit nurses' perspectives on preventative care. The guide was developed by the researchers based on the study objectives and relevant literature, then reviewed by two external qualitative research experts and pilot tested with two nurses for refinement before use. Interviews were conducted in Arabic or English based on the participant's language preference, audio-recorded with permission, and lasted 30-60 minutes. Detailed notes were taken by the interviewer. Recordings were transcribed verbatim, then translated into English if necessary. Arabic transcripts were checked against the recordings by a bilingual research team member for accuracy before translation.

Question	Probes
1. Tell me about your role in providing preventative care services in your primary healthcare setting.	- What types of preventative services do you provide? - How much of your role focuses on prevention vs treatment?
2. How has the integration of preventative care models impacted your nursing practice?	- Impacts on nursing role, skills, knowledge needs - Impacts on relationships and interactions with patients - Impacts on collaboration with healthcare team
3. What do you see as the most important benefits of providing preventative care services in primary care?	- Benefits for patients - Benefits for population health - Benefits for health system (e.g. reduced costs, utilization)
4. What challenges or barriers have you encountered in providing preventative care?	- Patient-related barriers - Organizational barriers - System-level barriers - Gaps in training or resources
5. What factors have enabled or supported you in integrating preventative care into your practice?	- Leadership and organizational factors - Technology and digital tools - Training and education - Teamwork and collaboration
6. How do you think preventative care services in primary care can be enhanced or improved?	- Recommendations for nursing practice - Recommendations for primary care delivery models - Recommendations for policy and system changes

### Data

Data were analyzed using thematic analysis, a flexible qualitative analytic method focused on identifying, analyzing, and reporting patterns or themes within the data (Braun & Clarke, 2021). The six-phase approach to thematic analysis was followed:

1. Familiarization with the data through repeated reading of transcripts and notes
2. Generating initial codes by labelling meaningful segments of data
3. Searching for themes by collating related codes
4. Reviewing themes to ensure they accurately represent coded extracts and entire dataset
5. Defining and naming themes to clarify their scope and meaning
6. Producing the report with illustrative data extracts and analytic narrative

Coding was performed using NVivo qualitative data analysis software. An inductive, data-driven approach was used, allowing themes to emerge from participants' perspectives rather than imposing a pre-determined framework. Coding was conducted independently by two researchers who met regularly to compare interpretations and reach consensus. The full research team reviewed and refined the emerging themes. Analytic memos were used to document theme development and relationships. Interviews continued until thematic saturation was evident, the point at which no new themes emerged from additional data collection (Hennink et al., 2017).

Several strategies enhanced the trustworthiness of the data analysis (Korstjens & Moser, 2018). The credibility of the findings was strengthened through the purposive maximum variation sampling to include diverse perspectives. Member checking was conducted by sharing a summary of key findings with participants for validation. A detailed

audit trail of methodological and analytic decisions was maintained to ensure dependability. The use of NVivo software enabled systematic data management and retrieval to enhance confirmability. Detailed descriptions of the research context and participants allow readers to assess transferability to their own settings.

## Results

### Participant Characteristics

A total of 20 primary care nurses participated in the study (Table 2). The majority were Saudi nationals (85%), female (90%), and staff nurses (75%). They represented five different regions and their experience in primary care ranged from 2-18 years (mean 7.6 years). All were involved in delivering one or more preventative services as part of their role.

Table 2. Participant characteristics (n=20)

Characteristic	n (%)
Nationality	
Saudi	17 (85%)
Non-Saudi	3 (15%)
Gender	
Female	18 (90%)
Male	2 (10%)
Age (years)	
20-29	3 (15%)
30-39	11 (55%)
40-49	5 (25%)
≥50	1 (5%)
Nursing role	
Staff nurse	15 (75%)
Nurse manager	2 (10%)
Specialty nurse	3 (15%)
Years in primary care	
<5	6 (30%)
5-9	8 (40%)
≥10	6 (30%)
Preventative services*	
Screenings	20 (100%)
Vaccinations	18 (90%)
Health education	14 (70%)
Wellness counseling	10 (50%)

\*Multiple responses allowed

### Thematic Findings

Four main themes were identified from the analysis: 1) Perceived benefits of preventative care, 2) Challenges with preventative care delivery, 3) Factors enabling preventative care, and 4) Recommendations to enhance preventative services. The themes and subthemes are presented below with illustrative quotes.

#### Theme 1: Perceived Benefits of Preventative Care

Nurses strongly believed in the importance and positive impacts of providing preventative care in the primary care setting. Three main benefits were perceived: 1) Improving patient outcomes, 2) Enhancing population health, and 3) Reducing healthcare costs and utilization.

1A. Improving Patient Outcomes. Nurses described how preventative services can help improve the health and wellbeing of individual patients by preventing disease onset, detecting risk factors and illness early, and equipping patients to better manage their health.

"I see preventative care as so important because it helps our patients stay healthy and avoid getting sick in the first place. The screenings we do can catch problems early when they're more treatable. And the education and counseling we provide gives patients the knowledge and tools to make healthier choices." (Nurse 7)

"For patients with chronic diseases, the preventative care we provide like monitoring their condition, adjusting medications, and giving lifestyle advice helps prevent complications and keep their illness under control. This improves their quality of life and helps them stay well." (Nurse 12)

1B. Enhancing Population Health. Beyond individual patient benefits, nurses highlighted the positive impacts of preventative care on advancing the health of the community as a whole by reducing risk factors and disease burden.

"By focusing more on prevention in primary care, we can make a real difference in the health of our population. So many of the major health problems like obesity, diabetes, and heart disease are preventable with the right care and education. If we can reduce the rates of these conditions, it will have huge benefits for public health." (Nurse 18)

"Providing preventative services to all the patients in our community, and especially reaching those who are most at risk, is so important for reducing health disparities and improving population health outcomes. Primary care is the perfect setting to do this." (Nurse 5)

1C. Reducing Healthcare Costs and Utilization. Nurses also perceived important health system benefits from preventative care in terms of reducing costs and utilization associated with treating advanced disease.

"I see patients with complications from diseases that could have been prevented and it's heartbreaking. Not only is the human cost enormous, but the financial costs of treating advanced illness are so high. By preventing these conditions from developing in the first place, or catching them early, we can save the health system a lot of money." (Nurse 11)

"When we provide good preventative care and keep people healthier, it reduces their need for expensive hospital and specialist visits. This frees up those resources for people who really need them. Prevention is much more cost-effective than treating disease after the fact." (Nurse 20)

#### Theme 2: Challenges with Preventative Care Delivery

While nurses were strong believers in preventative care, they also encountered significant challenges putting it into practice. Key barriers included: 1) Time constraints, 2) Staffing and resource limitations, 3) Lack of training and knowledge, and 4) Low patient awareness and engagement.

2A. Time Constraints. Having sufficient time to provide comprehensive preventative care was a major challenge given high patient volumes and short appointment slots.

"We're so busy seeing a high number of patients each day for acute problems that it's hard to find time to provide all the preventative services that we should, like in-depth counseling and education. Those things take time and it often gets missed because we have to keep visits short." (Nurse 13)

"I try my best to cover preventative care but it's challenging to fit it all in. Doing a thorough health risk assessment, screenings, education all takes time. And if the patient has multiple concerns, the prevention piece often gets cut short because we have to prioritize their immediate needs." (Nurse 9)

2B. Staffing and Resource Limitations. Insufficient staffing and resources to provide preventative services was another common barrier nurses faced in their practice setting.

"Our center doesn't have dedicated staff to provide preventative care so it falls to the primary care nurses on top of all our other responsibilities. We're stretched thin and don't always have the capacity to do as much prevention as we'd like." (Nurse 6)

"We lack some of the supplies and equipment we need to provide comprehensive preventative services like up-to-date educational materials, screening tools, and vaccines. It's hard to do our best prevention work without adequate resources." (Nurse 15)

2C. Lack of Training and Knowledge. Gaps in nurses' training and knowledge related to preventative care was another challenge that limited their confidence and capacity in providing services.

"In my nursing education we learned the basics of health promotion but not a lot of specifics on how to deliver evidence-based preventative services. I've had to learn a lot on the job and sometimes feel I lack the expertise to give the best preventative care." (Nurse 2)

"There are always new guidelines and recommendations coming out for preventative screenings and interventions. It can be hard to stay on top of the latest evidence and I don't feel I've had enough continuing education on prevention best practices." (Nurse 17)

2D. Low Patient Awareness and Engagement. Nurses described challenges with getting patients to understand the importance of preventative care and adhere to recommended services.

"Many of my patients don't see the need for preventative visits if they're not feeling sick. There's a lack of awareness about why prevention is important and the role of primary care in keeping them healthy. It can be hard to get them engaged in preventative care." (Nurse 8)

"Even when patients do come in for preventative services, follow through can be low. They may agree to take medications or make lifestyle changes in the clinic but then not adhere to it at home. It's a constant challenge to educate and motivate them to stick with prevention long-term." (Nurse 19)

#### Theme 3: Factors Enabling Preventative Care

Nurses identified several key factors that helped facilitate and enable the successful delivery of preventative care in their setting: 1) Supportive leadership and organizational culture, 2) Dedicated preventative care visits, 3) Effective technology and decision support, and 4) Teamwork and collaboration.

3A. Supportive Leadership and Organizational Culture. Nurses felt that having leaders and an organization that valued and prioritized preventative care made a big difference in their ability to integrate it into practice.

"Our center director is a big champion of preventative care and is always pushing us to do more. She makes sure prevention is a standing item in our meetings and celebrates when we meet our prevention targets. Having that leadership support and prioritization is so key." (Nurse 10)

"There's a strong culture of prevention in our organization that runs from the top-down. We're all united around the goal of keeping patients healthy and leaders put their money where their mouth is by giving us protected time and resources to focus on prevention. It makes such a difference." (Nurse 4)

3B. Dedicated Preventative Care Visits. Having dedicated, longer appointments focused solely on preventative care, rather than squeezing it into problem-focused visits, was seen as an important facilitator.

"A big thing that's helped us is having special preventative care clinics where patients come in just for that purpose. The appointments are longer so we can really take the time to review all the screening and education the patient needs without being rushed." (Nurse 16)

"Scheduling in dedicated prevention visits has made a world of difference. Both the nurses and patients know that's the sole focus so we can cover everything in-depth without distractions. It also sends the message that prevention is just as important as treating problems." (Nurse 3)

3C. Effective Technology and Decision Support. Nurses described how well-designed technology solutions and decision support tools could enable more efficient, evidence-based preventative care.

"Our electronic medical record has built-in alerts that pop up when a patient is due for a preventative screening or vaccine. It's a great reminder and saves us having to track everything manually. It also automatically generates patient education materials we can give out." (Nurse 14)

"We use an evidence-based clinical decision support system that walks us through all the preventative care a patient needs based on their age and risk factors. It's a foolproof way to make sure we're following the latest guidelines and not missing anything." (Nurse 1)

3D. Teamwork and Collaboration. Nurses emphasized how collaborating closely with other members of the primary care team enabled more comprehensive preventative care than they could provide alone.

"We're lucky to have a really tight-knit primary care team. I work closely with the physicians, pharmacists, and educators to make sure the patient's full preventative needs are met. We're all working together toward the same prevention goals." (Nurse 7)

"Having a team-based approach has really enhanced the preventative care we provide. For example, I can focus on screening and immunizations while our health educators provide in-depth counseling. The physicians reinforce the prevention plan. It's a real team effort." (Nurse 11)

#### Theme 4: Recommendations to Enhance Preventative Services

Nurses provided several recommendations to improve the planning and delivery of preventative services in the Saudi primary care context: 1) Increase staffing and dedicated prevention resources, 2) Expand nurse training in preventative care, 3) Enhance patient education and outreach, and 4) Optimize technology and data capabilities.

4A. Increase Staffing and Dedicated Prevention Resources. Nurses stressed the need for more dedicated staffing and resources focused on prevention to enable high-quality preventative care.

"My top recommendation would be to allocate more dedicated staff and longer appointment slots for prevention. We need health educators, dieticians, nurses all playing a role so we can provide patients with comprehensive preventative care without burning out staff." (Nurse 13)

"More resources need to be channeled into prevention. Imagine how much more we could do with adequate staffing, equipment, medications, and patient education materials. Leadership needs to invest more in prevention infrastructure." (Nurse 2)

4B. Expand Nurse Training in Preventative Care. Nurses called for more training and professional development opportunities to build their knowledge and skills in evidence-based preventative care.

"Nursing curricula need to put a bigger emphasis on how to deliver effective preventative services. We need courses and hands-on training that reflect the latest prevention science and teach behavior change skills. This should be a core nursing competency." (Nurse 19)

"There need to be more continuing education opportunities focused on prevention, like conferences, seminars, journal clubs to keep our knowledge current. I'd also love to see the development of a preventative care nursing specialty with in-depth training." (Nurse 9)

4C. Enhance Patient Education and Outreach. Nurses recommended strengthening patient education initiatives to raise awareness of preventative care and improve engagement.

"We need more culturally tailored, literacy-appropriate patient education campaigns and materials that explain what preventative care is, why it's important, and what services are available. We should educate patients at every touch point – in the clinic, community, schools, mosques." (Nurse 6)

"I'd like to see more proactive outreach to get patients in for preventative visits, like reminder calls, texts, portal messages. We should also educate community leaders and influencers about prevention so they can champion it to their networks." (Nurse 18)

4D. Optimize Technology and Data Capabilities. Nurses saw opportunities to leverage technology and data to enable more targeted, efficient, and measurable preventative care.

"We need better digital tools that make it easy to identify patients who are overdue for preventative services, automate outreach, and track prevention performance. Having good data dashboards would help us target improvement efforts." (Nurse 5)

"I envision a future where we can use predictive analytics to identify patients at highest risk and most in need of preventative interventions, then proactively reach out to them. Also using telemedicine to deliver some preventative services virtually would be a game-changer." (Nurse 15)

#### Discussion

This study provided an in-depth exploration of primary care nurses' perspectives on the integration of preventative care models in the Saudi healthcare context. The findings offer valuable insights into nurses' perceptions of the importance, challenges, enablers, and opportunities for enhancing preventative care delivery. Nurses were ardent believers in the myriad benefits of preventative care for improving patient outcomes, population health, and health system efficiency. However, the ideals they strived for often clashed with the realities of overburdened primary care systems facing pressing demands. Time constraints, staffing shortages, training gaps, and patient barriers posed formidable challenges to the delivery of optimal preventative care.

The findings echo previous research on the obstacles nurses encounter providing preventative services in primary care globally. Studies from the U.S. to Finland have similarly documented that rushed clinic visits and competing demands crowd out time for delivering comprehensive preventative care (Boase et al., 2012; Majjala et al., 2018). Limited training and unclear role expectations also contribute to nurses' low self-efficacy in tasks like providing behavioral counseling and health education (Walkers et al., 2020). This study adds crucial perspectives from nurses in an Arab country actively striving to strengthen the prevention orientation of its primary care system.

At the same time, this study elucidated key factors enabling the successful integration of preventative care. Nurses reported that supportive leadership, a culture of prevention, dedicated visits, effective technology, and strong teamwork greatly facilitated the provision of preventative services. This reinforces the importance of taking a systems approach to enhancing prevention, in which elements at the individual provider, organizational, and environmental levels are addressed in tandem (Issel, 2021). For example, improving nurses' preventative care knowledge and skills through education must be accompanied by changes to clinic workflows, staffing models, and performance expectations to translate into sustained practice change.

The recommendations offered by nurses to strengthen preventative services provide a roadmap of priority areas for improvement. Continued investment in building the primary care nursing workforce's capacity to deliver preventative care is essential, through expanded staffing, training, and professional development opportunities. Raising patient and community awareness of the importance of preventative care and improving access and engagement through tailored education and outreach strategies is also critical. Fully leveraging the potential of digital technologies and data analytics to enable more targeted, efficient, and measurable preventative services should be a key priority. These technology tools can help identify patients most in need, facilitate care delivery and coordination, and track prevention outcomes.

The study findings should be interpreted in light of several limitations. While the sample included nurses from diverse primary care settings, it was limited to one geographic region of KSA. The perspectives of nurses in other regions may differ. The study also relied on self-report data, which may be subject to recall and social desirability biases. Future research should combine nurse interviews with direct observation of preventative care delivery to further elucidate challenges and best practices. Comparative studies examining nurse-delivered preventative care across different health systems in the Middle East would also provide valuable insights.

#### Conclusion

This qualitative study provides timely insights into the perspectives of primary care nurses on the integration of preventative care in the KSA health system. Nurses strongly believed in the importance of preventative care, but faced significant challenges implementing it in practice, including time constraints, resource limitations, knowledge gaps, and patient barriers. Supportive leadership, dedicated prevention visits, effective technology and decision support tools, and team collaboration were seen as key enablers of successful preventative care delivery. Increasing the primary care nursing workforce, expanding nurse training in prevention, enhancing patient education and

engagement, and optimizing technology and data capabilities were recommended as priority areas for strengthening preventative services. The study findings can inform the development and implementation of effective strategies to enhance the quality and reach of nurse-delivered preventative services in KSA and beyond. Continued research on primary care nurses' roles and experiences providing preventative care is critical to realizing the transformative potential of prevention-oriented health systems.

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