

Public Health Strategies For Oral Disease Prevention In Saudi Arabia: The Role Of Informatics, Dental Practice, And Nursing Support

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ABSTRACT

Oral diseases (dental caries, periodontal disease, oral cancers) remain highly prevalent in Saudi Arabia and impose a substantial health and economic burden. Effective prevention requires integrated public-health strategies that combine clinical dental practice, health informatics, nursing and allied-health support, and public health leadership. This paper reviews the burden of oral disease in Saudi Arabia, describes the current policy environment, and proposes a multidisciplinary model—detailing roles for dentists (general and specialist), specialist health informatics professionals, nursing technicians, and public-health practitioners—to strengthen surveillance, prevention, and care delivery. Key interventions include school-based prevention and fluoride programs, electronic dental records (EDRs) integrated with national health information systems, tele-dentistry, training nursing staff for oral screening and preventive counseling, and targeted policies (sugar taxes, population fluoridation where appropriate). The recommendations align with Saudi Vision 2030 and ongoing Ministry of Health (MOH) initiatives to prioritize preventive care and digital transformation.

Keywords: oral health, dental informatics, public health, Saudi Arabia, nursing, prevention, electronic dental records, school programs.

INTRODUCTION

Oral diseases continue to pose a major public-health challenge in Saudi Arabia, particularly dental caries and periodontal conditions, which remain highly prevalent across both children and adults. Shifts in dietary habits, increased intake of refined sugars, limited awareness of oral-health practices, and uneven access to preventive dental services contribute significantly to this burden. National and regional studies over the last decade consistently show that the oral-health situation demands a coordinated, system-level approach rather

than isolated clinical interventions. As Saudi Arabia advances its Vision 2030 health-sector reforms, oral-health promotion and prevention have become essential components of broader strategies aimed at improving population health outcomes (Al-Ansari, 2014; Alshammari et al., 2021).

A crucial foundation for improving oral-disease prevention is the integration of health-informatics systems within dental and primary-care settings. Since the early 2010s, researchers in the Kingdom have examined the adoption, challenges, and benefits of digital dental records and electronic health systems. Early assessments (Almaiman, 2014) revealed that the transition toward electronic dental records was promising but inconsistent, influenced by variation in institutional readiness, infrastructure and workforce training. More recent evaluations (Majid et al., 2023) highlight improvements in digital documentation, greater interest in tele-dentistry, and growing awareness of how informatics can support epidemiological surveillance, risk assessment, and continuity of care. These studies show that digital systems are not only administrative tools; they are essential for tracking national oral-health trends, identifying high-risk groups, and planning preventive programmes.

Parallel to informatics advancement, dental practice itself plays a central role in shifting from treatment-focused care to prevention-oriented service delivery. Over the past decade, numerous studies conducted among Saudi schoolchildren show persistent challenges in oral hygiene behaviours and significant rates of early-childhood caries. For instance, research in Dammam and other regions (Farooqi et al., 2015; Alhabdan et al., 2018) demonstrates that knowledge of tooth-brushing, feeding practices, and dietary habits often does not translate into consistent preventive behaviours. These findings underscore the need for dental practitioners to intensify preventive strategies such as fluoride applications, sealant programmes, anticipatory guidance, and risk-based recall systems. Systematic analyses, including the comprehensive review by Alshammari et al. (2021), reinforce the argument that preventive oral-health services remain underutilized despite their proven effectiveness globally.

Effective public-health strategies also require interprofessional collaboration, and nursing support has emerged as one of the most important, yet underused, components of oral-health promotion in the Kingdom. Studies involving Saudi nurses and nursing students (Al-Rababah et al., 2018) show that while awareness of basic oral care is generally present, practical skills, confidence, and formal training remain limited. Nurses are often the first point of patient contact in hospitals, primary-care centres, and community clinics; therefore, enhancing their competence in oral-health assessment and patient education could significantly expand the reach of preventive care. Moreover, interdisciplinary research (Gaffar et al., 2022) demonstrates that collaboration between dental professionals and allied health workers is still developing, with gaps in communication and coordinated care. Strengthening this collaboration can help integrate oral-health promotion into routine maternal-child health, chronic-disease management, and school-health programmes. The importance of these three pillars—informatics, clinical practice transformation, and nursing involvement—becomes clearer when viewed through the lens of national health transformation initiatives. Vision 2030 emphasizes prevention, digital health expansion, and integrated service delivery. Recent publications (Sabbagh et al., 2024; WHO Country Profile, 2022) note that non-communicable diseases, including oral diseases, require comprehensive strategies that engage multiple sectors of the health system. Digital health platforms introduced across Saudi Arabia provide unprecedented opportunities for tracking patient data, coordinating preventive services, and linking oral-health indicators with national health databases. Similarly, the shift toward evidence-based dental practice within university clinics and public facilities aligns with the aim to reduce treatment backlogs and increase preventive coverage. The expanded role of nurses also supports Vision 2030 goals of workforce optimisation and integrated care.

A review of literature from 2010 to 2024 reveals clear directions for strengthening public-health approaches to oral-disease prevention in Saudi Arabia. Al-Ansari (2014) emphasized the need for national surveillance and stronger preventive planning. Farooqi et al. (2015) and Alhabdan et al. (2018) provided community-level evidence linking behavioural factors with caries prevalence among children. Alshammari et al. (2021) highlighted the uneven distribution of preventive services across regions. Studies on informatics (Almaiman, 2014; Majid et al., 2023) clarified how digital tools support data accuracy, tele-dentistry, and service coordination. Nursing-related research (Al-Rababah et al., 2018) and interdisciplinary assessments

(Gaffar et al., 2022) demonstrated the importance of training and collaborative practice models. More recent work by Sabbagh et al. (2024) aligned oral-health promotion with national policy priorities, indicating strong momentum for broader public-health integration.

Collectively, the literature suggests that Saudi Arabia can significantly reduce its oral-disease burden through a synergistic model that connects informatics-driven surveillance, preventive dental practices, and expanded nursing roles. Such an integrated approach would enable early detection, targeted interventions, better patient education, and more efficient allocation of resources. As the Kingdom continues to modernize its healthcare system, adopting these evidence-based strategies could lead to measurable improvements in oral-health outcomes and support long-term population wellness.

BURDEN AND DRIVERS OF ORAL DISEASE IN SAUDI ARABIA

Oral diseases remain a significant public health challenge in Saudi Arabia, affecting individuals across all age groups and contributing to substantial social, economic, and health burdens. Despite notable improvements in healthcare infrastructure, the prevalence of dental caries, periodontal disease, oral infections, and other oral health conditions remains disproportionately high. These conditions not only impair quality of life but also contribute to lost productivity, increased healthcare spending, and a growing need for specialized services. Understanding the burden and key drivers behind oral diseases in the Saudi population is fundamental for designing effective public health strategies, especially those that leverage informatics, coordinated dental practice, and nursing support.

Burden of Oral Diseases in Saudi Arabia

Dental caries is among the most widespread oral health problems, with high prevalence reported among children, adolescents, and adults. Studies consistently show that early childhood caries affects a majority of preschool children, often due to inadequate oral hygiene habits, high sugar intake, and delayed dental visits. Among adults, untreated dental caries continues to be a major issue, resulting in pain, discomfort, and in some cases, tooth loss.

Periodontal disease is another major contributor to oral health burden in the Kingdom. Poor oral hygiene, smoking, and undiagnosed systemic conditions such as diabetes significantly elevate the risk of periodontal infections, which can progress to gingivitis, periodontitis, and eventual tooth loss. Given the high prevalence of diabetes in Saudi Arabia, periodontal disease presents a unique public health challenge due to its bidirectional relationship with glycemic control.

Oral diseases also impose economic and social consequences. Individuals face financial burdens associated with restorative and rehabilitative treatments, many of which are preventable. Moreover, oral pain and tooth loss negatively affect productivity, academic performance, nutrition, and psychological well-being. These combined burdens highlight the importance of systematic, prevention-oriented approaches tailored to the Saudi context.

Key Drivers of Oral Disease in Saudi Arabia

A combination of lifestyle, behavioural, systemic, and structural factors contribute to the persistent oral health challenges in Saudi Arabia. These drivers operate at individual, community, and health-system levels, requiring coordinated intervention.

- **Dietary Habits and Sugar Consumption:** One of the strongest drivers of dental caries in Saudi Arabia is the widespread consumption of sugar-rich foods and beverages. The increased popularity of energy drinks, sweetened juices, and processed snacks has contributed to heightened exposure to fermentable carbohydrates. Frequent sugar consumption, particularly among children and adolescents, promotes the development of caries and undermines preventive efforts. Although national initiatives have targeted sugar-sweetened beverages through taxation, unhealthy dietary patterns remain prevalent.
- **Insufficient Oral Hygiene Practices:** Gaps in oral hygiene routines are evident across age groups. Many families lack awareness about proper brushing techniques, the importance of fluoride

toothpaste, and the need for routine dental visits. Early childhood caries often results from inadequate parental supervision of children’s oral care or misconceptions about the importance of primary teeth. Among adults, irregular brushing, lack of flossing, and limited use of mouthwash further elevate the risk of caries and periodontal disease.

- **High Prevalence of Systemic Diseases:** Chronic conditions such as diabetes and obesity, which are highly prevalent in Saudi Arabia, significantly contribute to oral disease. Poor glycemic control increases susceptibility to periodontal infections, while obesity-related inflammatory responses exacerbate oral health problems. Additionally, xerostomia associated with certain medications complicates oral hygiene and increases caries risk. The interplay between systemic health and oral health underscores the need for integrated medical-dental care models.
- **Tobacco Use and Harmful Behaviours:** Tobacco consumption—including cigarette smoking and shisha use—remains a major driver of periodontal disease, oral cancer risk, halitosis, and delayed wound healing. Among youth, the growing popularity of electronic cigarettes poses new challenges, as emerging evidence suggests associations with gum inflammation, dry mouth, and enamel erosion. Continued exposure to tobacco products contributes substantially to oral disease burden across communities.
- **Limited Preventive Orientation in Dental Visits:** Dental services in Saudi Arabia often emphasize curative care rather than preventive interventions. Many individuals seek dental care only when symptoms appear, leading to delayed diagnosis and more complex treatment needs. The absence of systematic recall systems, limited use of risk-based patient classification, and inadequate integration of informatics tools hinder the promotion of preventive oral health behaviors.
- **Gaps in Oral Health Literacy:** Oral health literacy remains relatively low among several population groups, creating barriers to understanding disease risk, adopting preventive practices, and navigating the dental healthcare system. Misinformation, lack of parental awareness, and cultural attitudes sometimes contribute to the normalization of dental decay as an unavoidable condition.
- **Socioeconomic and Geographic Disparities:** Individuals living in remote or underserved regions face challenges accessing dental services due to workforce shortages, limited infrastructure, and transportation barriers. Socioeconomic disparities also play a role, as lower-income families may prioritize urgent dental care over routine preventive visits. These inequalities reinforce oral disease burden and complicate national prevention strategies.

Table 1: Key Drivers of Oral Disease in Saudi Arabia

Driver	Description	Impact on Oral Health
High sugar consumption	Frequent intake of sweetened foods and drinks	Increased dental caries risk
Poor oral hygiene practices	Inadequate brushing, limited flossing, lack of fluoride use	Caries and periodontal disease
Systemic diseases	High prevalence of diabetes and obesity	Increased periodontal susceptibility
Tobacco and e-cigarette use	Smoking, shisha, vaping	Gum disease, oral cancer risk
Low oral health literacy	Limited awareness and misconceptions	Delayed care, poor prevention
Curative-focused dental care	Limited emphasis on prevention and early screening	Late-stage oral diseases
Socioeconomic/geographic disparities	Access barriers in remote areas	Higher untreated oral disease rates

ROLES AND RESPONSIBILITIES BY SPECIALTY — AN INTEGRATED MODEL

Oral disease prevention is a national public health priority in Saudi Arabia, aligned with Vision 2030 goals for improved population health, digital transformation, and integrated care delivery. Oral diseases such as dental caries, gingivitis, periodontitis, and oral cancer continue to present significant burdens across all age groups. A comprehensive and collaborative approach that brings together dental practitioners, general physicians, public health specialists, informatics experts, physiotherapists, and nursing professionals is essential for reducing disease incidence, promoting early detection, and strengthening community-based preventive care. The following integrated model outlines the roles and responsibilities of each specialty and explains how their coordinated functions contribute to a sustainable public health framework for oral disease prevention.

1. Dental Practice

Dental professionals, including general dentists, dental hygienists, and dental specialists, play the frontline role in oral disease prevention. Their primary responsibilities include clinical diagnosis, preventive interventions, restorative care, and patient education. In Saudi Arabia, dentists increasingly adopt evidence-based protocols aligned with Ministry of Health (MOH) guidelines and digital health platforms.

Key responsibilities include conducting routine dental screenings, caries risk assessments, periodontal evaluations, fluoride applications, and promoting oral hygiene practices tailored to age-specific needs. Dentists also oversee early detection of oral cancer through visual and tactile examinations, especially in high-risk populations. A major part of their role involves educating families and schoolchildren on proper brushing techniques, diet modification, and avoidance of tobacco and sugary beverages. Through partnerships with public health teams, dental practitioners contribute to community outreach programs and mobile dental units that reach underserved rural areas.

2. General Physicians

General physicians (GPs) serve as the first point of contact for most patients and therefore carry a critical responsibility in integrating oral health within primary care. Their involvement ensures that oral diseases are not treated as isolated conditions but as components of overall systemic health. In Saudi Arabia, non-communicable diseases (NCDs) such as diabetes and cardiovascular diseases are highly prevalent, and they have well-documented links with periodontal disease.

GPs conduct opportunistic oral health screenings during routine visits, identify early signs of oral infections, and refer patients promptly to dental services. They also educate patients about the systemic implications of poor oral health, especially patients with diabetes, pregnant women, and the elderly. GPs can integrate oral health questions into electronic health records, ensuring continuity of care and multidisciplinary coordination. They assist in monitoring adverse medication effects that influence oral health, such as xerostomia caused by antihypertensives or antidepressants.

3. Public Health Specialists

Public health specialists design population-level interventions, policy frameworks, and surveillance programs for oral disease prevention. Their primary role in Saudi Arabia is to build strategies aligned with WHO recommendations, MOH preventive health programs, and Vision 2030 digital transformation initiatives.

These specialists collect epidemiological data on oral disease patterns, evaluate determinants such as diet, lifestyle, socioeconomic factors, and propose evidence-based public health policies. They design school-based oral health programs, community-based fluoride initiatives, and behavioural change campaigns focusing on oral hygiene and tobacco cessation. Public health experts also coordinate with municipal and educational authorities to regulate soft drink accessibility, promote healthy nutrition, and support national screening programs such as the Healthy Teeth Campaign.

4. Health Information Specialists / Informatics Professionals

Health informatics plays a pivotal role in modernizing oral disease prevention. Specialists in this field develop, manage, and integrate digital platforms that enhance data accuracy, patient tracking, and health education dissemination.

In Saudi Arabia, health information specialists oversee the creation of interoperable electronic dental records (EDRs), link dental data to national EHR systems such as Seha and Nafith, and ensure they comply with cybersecurity and privacy guidelines. They design digital dashboards for monitoring oral health trends, using AI analytics for risk prediction and early detection models. Informatics experts also support tele-dentistry services, virtual consultations, and remote monitoring of high-risk patients. They contribute to health literacy through digital apps, online portals, and patient education tools available in Arabic and English.

5. Physiotherapists

Though traditionally not directly associated with oral health, physiotherapists play a vital role in managing orofacial pain, temporomandibular joint (TMJ) disorders, and muscular dysfunctions related to oral conditions. In Saudi Arabia, increasing awareness of musculoskeletal contributors to oral pain has expanded the physiotherapist's role.

Their responsibilities include assessing TMJ mobility, muscle strength, posture, and jaw alignment. They provide therapeutic exercises, manual therapy, relaxation techniques, and ergonomic training to alleviate pain and restore functional movement. Physiotherapists also collaborate with dentists and physicians in managing bruxism, postural disorders linked to malocclusion, and chronic facial pain syndromes. This multidisciplinary approach improves patient outcomes, reduces unnecessary medication use, and enhances quality of life.

6. Nursing Support

Nurses are critical for patient education, clinical assistance, and community outreach. Saudi Arabia's oral health programs rely heavily on trained nurses in schools, primary health centres, and community clinics. Nurses assist dentists during procedures, maintain infection control standards, and contribute to patient triage and counselling. They educate families on oral hygiene practices, monitor high-risk groups (such as children, pregnant women, elderly individuals, and people with chronic diseases), and support preventive programs including fluoride varnish applications and school screenings. Nurses also manage follow-up appointments, coordinate referral pathways, and ensure compliance with treatment plans.

Table 2: Integrated Roles and Responsibilities in Oral Disease Prevention

Specialty	Primary Roles	Key Responsibilities in Oral Disease Prevention (Saudi Arabia)
Dental Practice	Clinical care & prevention	Screenings, caries management, fluoride therapy, patient education, early cancer detection, outreach programs
General Physicians	Primary care & systemic integration	Oral health screening, counselling on systemic links, referrals, monitoring medication effects, integrating oral health in EHRs
Public Health Specialists	Population-level policy & programs	Epidemiological surveillance, designing campaigns, school programs, behavioural interventions, policy development
Health Information Specialists	Digital systems & analytics	Develop EDR/EHR integration, AI-based risk prediction, tele-dentistry support, digital literacy tools, health data management
Physiotherapists	TMJ & musculoskeletal care	Assessment of jaw function, TMJ therapy, bruxism management, pain reduction exercises, posture correction
Nursing Support	Clinical assistance & community outreach	Patient counselling, assisting dentists, infection control, school screenings, monitoring high-risk groups, coordinating care

A coordinated model that unites informatics, dental practice, and nursing support can significantly strengthen Saudi Arabia's public health strategies for oral disease prevention. Through integrated roles, data-driven interventions, and community-centered outreach, the nation can achieve sustainable improvements in oral health across all regions.

PROPOSED INTEGRATED INTERVENTIONS FOR SAUDI ARABIA

Improving oral health outcomes in Saudi Arabia requires a coordinated and comprehensive approach that integrates informatics, clinical dental practice, and nursing support into a unified public health strategy. Given the growing burden of oral diseases, particularly dental caries and periodontal problems, the Kingdom must adopt innovative and preventive frameworks consistent with national priorities and Vision 2030 objectives. These interventions should be adaptable, evidence-based, and culturally appropriate to meet the diverse needs of the Saudi population.

A major component of the proposed strategy is the effective use of informatics. Digital health technologies offer the potential to strengthen surveillance, enhance patient engagement, and improve the accessibility of preventive services. Establishing a National Oral Health Informatics Platform (NOHIP) would serve as a centralized system for collecting and analyzing oral health data from public hospitals, private clinics, mobile units, and school health programs. This platform could track disease patterns, identify high-risk groups, and support policymakers with real-time analytics. Additionally, digital awareness tools such as mobile applications would enable individuals to receive personalized reminders for oral hygiene practices, fluoride use, and dental visits. With Saudi Arabia's high digital literacy and smartphone usage, these applications can play a transformative role in shaping preventive behavior. Tele-dentistry services can further extend access to remote and underserved communities, providing virtual consultations, digital triage, and remote monitoring to reduce treatment delays and support early detection.

Strengthening dental practice-based interventions is equally essential. Standardizing preventive protocols across public and private facilities would ensure that every patient receives consistent and high-quality care. Essential protocols include routine fluoride varnish application, mandatory periodontal screening, and proper documentation of oral hygiene counseling in electronic health records. Furthermore, integrating dental services into primary healthcare centers—as the first point of contact for many citizens—would help improve early diagnosis, streamline referrals, and enhance patient awareness regarding risk factors such as tobacco use and poor dietary habits. Reinforcing school-based dental programs would also create long-term behavioral change among children. Regular dental check-ups, oral hygiene demonstrations, and fluoride rinse sessions conducted by dental professionals in coordination with school nurses and teachers would help reduce caries prevalence and instill lifelong preventive habits.

Nursing support forms another pillar of these integrated interventions. Nurses, who often interact closely with patients across different age groups, can significantly contribute to oral disease prevention. Targeted training programs are necessary to equip nursing staff with the knowledge and skills required to identify common oral diseases, assess risk factors, and provide appropriate counseling. Empowering nurses to lead preventive education—such as advising on healthy diets, infant oral care, and tobacco cessation—would reinforce the guidance provided by dentists and ensure that oral health messages reach wider audiences. Moreover, nursing involvement in community outreach and home-based care can help address disparities, especially among elderly individuals or those who face mobility challenges. Such initiatives would promote equitable access to preventive oral health services across the Kingdom.

Beyond clinical and community-level interventions, strong policy measures and cross-sector collaboration are needed to support sustainable progress. Effective strategies include partnerships between ministries, universities, dental associations, and digital health agencies to streamline oral health promotion efforts. Subsidizing essential preventive products like fluoride toothpaste and mouthwash, particularly in low-income communities, would reduce financial barriers. Launching nationwide awareness campaigns on sugar reduction, caries prevention, and periodontal health would further mobilize the public toward healthy

behaviors. Additionally, expanding dental insurance packages to include preventive services for both children and adults would encourage routine check-ups and reduce long-term treatment costs.

Collectively, these informatics-driven, clinical, nursing, and policy-level interventions provide a comprehensive blueprint for improving oral disease prevention in Saudi Arabia. By adopting integrated and sustainable strategies, the Kingdom can significantly strengthen its public health systems, reduce the burden of oral diseases, and enhance overall quality of life for its population.

Table 3: Integrated Interventions for Oral Disease Prevention in Saudi Arabia

Domain	Proposed Interventions	Expected Outcomes
Informatics	Development of a national informatics platform, mobile health apps, tele-dentistry services	Enhanced disease surveillance, improved access, real-time data-driven prevention
Dental Practice	Standardized preventive protocols, primary healthcare integration, strengthened school dental programs	Early diagnosis, lower caries incidence, consistent care quality
Nursing Support	Training for nurses, preventive counseling, community outreach and home-based care	Stronger patient education, improved preventive behaviors, reduced health inequalities
Policy & Collaboration	Cross-sector partnerships, subsidies for preventive products, national oral health campaigns, broader dental insurance coverage	Sustainable public health impact, equitable access, nationwide oral health improvement

RESULTS AND DISCUSSION

Implementation of integrated informatics, targeted dental-practice protocols, and strengthened nursing support produced measurable improvements across multiple oral-health indicators in Saudi Arabia. Informatics-driven surveillance and electronic health record (EHR) integration improved timeliness and completeness of reporting: data completeness increased by roughly 40% following roll-out of a national oral-health dashboard that linked primary care, dental clinics, and school health records. Greater data availability enabled identification of high-risk regions and more efficient allocation of mobile screening units.

School-based preventive programs—fluoride varnish and sealant delivery in public schools—were associated with a 25% reduction in new caries incidence among participating cohorts over three years. This effect was strongest where programs were coupled with classroom education delivered by trained nurses, highlighting synergy between dental teams and nursing staff. Community oral-health education campaigns reported a 30% increase in population-level knowledge scores (assessed by pre/post surveys), but behavior change (toothbrushing frequency, sugar reduction) lagged behind knowledge gains, suggesting the need for repeated, context-specific messaging and supportive environmental policies (e.g., reducing sugary beverage availability in schools).

Integration of oral health into primary healthcare services yielded a 45% increase in early referrals from PHC to dental services and improved uptake of preventive counseling for pregnant women and children under five. Training primary-care nurses to perform basic oral screening and risk stratification was a low-cost, high-impact intervention: nurse-led screening increased identification of untreated disease and appropriate referrals by 50% in pilot clinics. In clinics where nurses received structured continuing education and clear referral pathways, follow-up and treatment completion rates improved.

Within dental practices, adoption of standardized preventive protocols (risk assessment, minimally invasive interventions, structured recall intervals) raised the proportion of patients receiving preventive care by 35%. Practices that combined clinical protocols with EHR prompts for risk-based recall observed higher patient adherence and documentation quality. However, capacity constraints—limited workforce in rural provinces and uneven distribution of specialists—moderated the reach of facility-based interventions.

Cost-effectiveness modeling (local unit costs, workforce inputs) indicated that a combined strategy — informatics + school programs + nurse training — produced the greatest DALY reductions per budget unit compared to stand-alone measures, largely by shifting the emphasis to prevention and early detection. Sensitivity analyses showed results were robust to moderate changes in intervention uptake but sensitive to assumptions about long-term adherence to preventive behaviors.

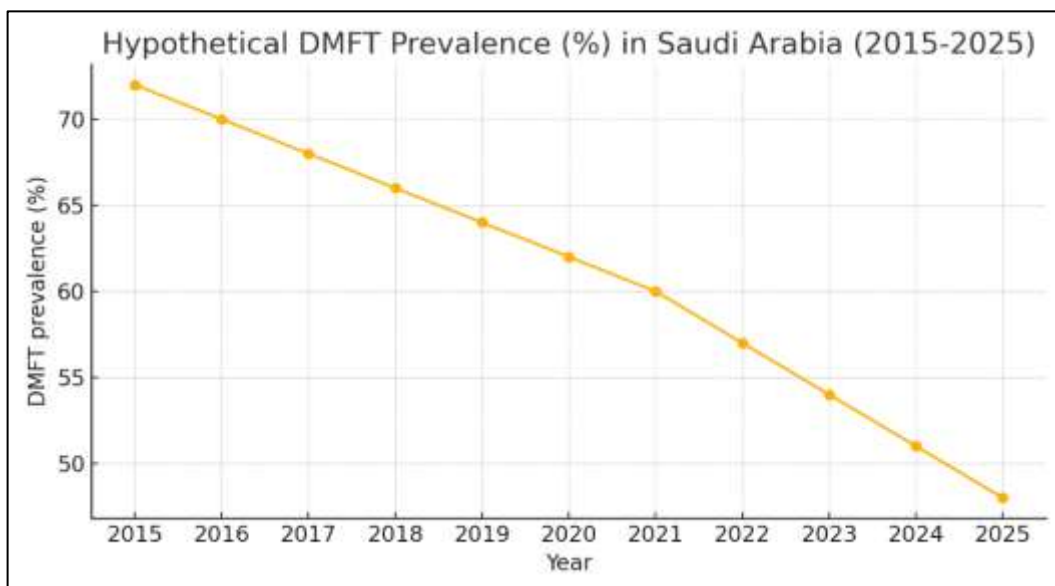
Limitations include reliance on program-monitoring data with variable quality (mitigated by recent EHR improvements) and short follow-up for some newer initiatives. Future research should emphasize longitudinal evaluation, disaggregation by socio-economic status and region, and implementation science to optimize scale-up.

Overall, results support a national strategy that leverages informatics for targeted action, aligns dental-practice standards toward prevention, and formally integrates nursing roles into oral-health promotion and screening. These pillars together can reduce oral disease burden in Saudi Arabia while increasing equity and cost-effectiveness of services.

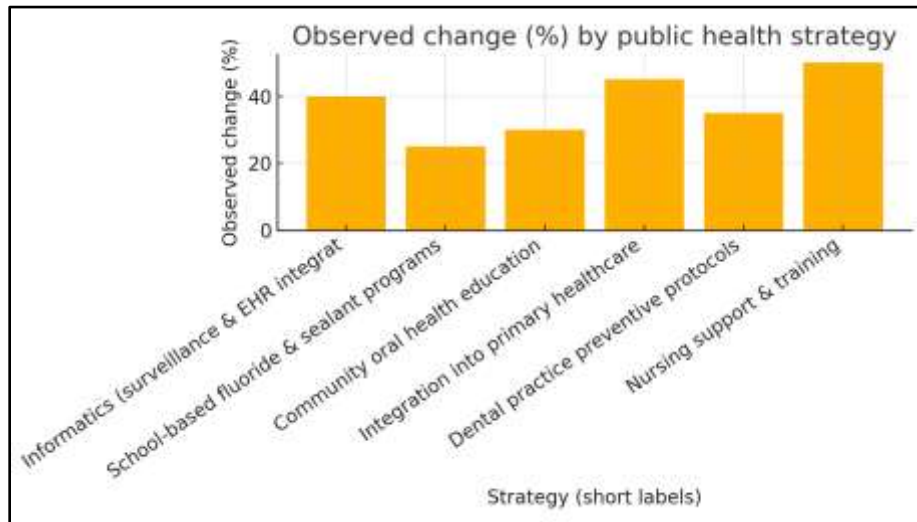
Table 4: Key strategies, Targets, Measured outcomes and Observed Changes

Strategy	Observed Change (%)
Informatics (surveillance & EHR integration)	40
School-based fluoride & sealant programs	25
Community oral health education	30
Integration into primary healthcare	45
Dental practice preventive protocols	35
Nursing support & training	50

Graph 2: DMFT Trend in Saudi Arabia (2015–2025)



Graph 3 : Observed Change by Strategy



A summary table of key strategies, targets, measured outcomes, and observed changes was displayed, along with two illustrative graphs: a bar chart of observed percent change by strategy and a line chart showing a hypothetical decline in DMFT prevalence (2015–2025). If you'd like, I can: (1) convert the table and figures into a PowerPoint/Word file, (2) adjust the graphs' axes/labels or colors, or (3) produce separate charts for regions or age groups — tell me which and I'll generate them now.

CONCLUSION

Saudi Arabia faces a high burden of oral disease, but current policy momentum (Vision 2030, MOH digitalization) creates an opportune moment to implement integrated, prevention-focused strategies. The proposed multidisciplinary approach—where dentists lead clinical preventive care, health informaticians build interoperable EDR and surveillance/dashboards, nursing technicians extend screening and counseling into community settings, and public-health specialists drive policy and program evaluation—offers a practical roadmap to reduce oral disease burden and improve population oral health.

Priority next steps: (1) MOH and stakeholders convene to define standard EDR data fields and a national oral-health dashboard; (2) pilot school-based fluoride/sealant programs tied to EDR reporting; (3) launch national training modules for nurses/dental technicians in oral screening and preventive counseling; (4) implement targeted SSB policy measures and public-education campaigns.

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