

Dental Hygiene Health in Saudi Arabia Evaluating Public Awareness, Practices, and the Role of Healthcare Policy

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ABSTRACT

Dental hygiene is a critical component of overall health, yet it remains underemphasized in many public health strategies. This study evaluates the state of dental hygiene health in Saudi Arabia by analyzing public awareness, practices, and the role of healthcare policy. A mixed-method approach, including surveys of 1,000 participants and interviews with 20 healthcare professionals, was used to gather comprehensive data. The findings reveal significant disparities between urban and rural populations, with urban areas exhibiting higher awareness (85%) and better practices, such as brushing twice daily (75%), compared to rural areas (60% awareness and 55% brushing). Cost, lack of awareness, and access to dentists were identified as primary barriers, particularly in rural regions. Statistical analysis shows a strong correlation between awareness and certain practices, such as annual dental visits ($r = 0.72$, $p = 0.005$), but weaker correlations with others, like flossing. Policy analysis highlights a focus on treatment over prevention, with accessibility rated highly but preventive initiatives receiving low scores. The study underscores the need for integrated policy reforms, enhanced education, and targeted public outreach to bridge gaps and promote better oral health outcomes. Recommendations include incorporating dental hygiene education into schools, subsidizing preventive care, and expanding access to dental services in underserved areas.

KEYWORDS: Dental Hygiene, Public Awareness, Oral Health Practices, Healthcare Policy, Saudi Arabia, Preventive Care, Public Health Disparities.

1. Introduction

Importance of Dental Hygiene

Dental hygiene is a cornerstone of general health and well-being, influencing not only oral health but also the overall quality of life (Mariotti & Hefti, 2024). Maintaining good oral hygiene helps prevent dental issues such as cavities, gum diseases, and bad breath, while also reducing the risk of systemic diseases like diabetes and cardiovascular conditions (Genaro et al. 2024). Despite its critical role, oral hygiene often receives limited attention in public health discourse, especially in

developing and emerging economies (Parmar et al. 2016).

The Saudi Arabian Context

Saudi Arabia has witnessed remarkable advancements in healthcare over the past decades, driven by substantial investments and policy reforms (Alam et al. 2022). However, dental hygiene remains an area of concern. Rapid urbanization, changing dietary habits, and a lack of widespread preventive care awareness have contributed to a growing burden of oral health issues. Studies indicate that dental caries and periodontal diseases are prevalent across different age groups in Saudi Arabia, highlighting the need for targeted interventions (Arshad et al. 2024).

Cultural and socioeconomic factors also play a significant role in shaping dental hygiene practices in the country. While urban populations have better access to dental care facilities, rural communities often face barriers such as limited access and high costs (Lipsky et al. 2024). These disparities underscore the importance of examining how public awareness, personal practices, and healthcare policies collectively impact oral health outcomes.

Gaps in Awareness and Practices

Public awareness about dental hygiene is a prerequisite for adopting effective practices (Jain et al. 2021). In Saudi Arabia, awareness levels vary significantly based on demographic factors such as age, education, and socioeconomic status (Zubaidi et al. 2015). While many individuals are aware of basic practices like brushing teeth, adherence to comprehensive oral hygiene routines, such as flossing and regular dental check-ups, remains low.

Additionally, misconceptions about dental health and the limited emphasis on preventive care in public campaigns exacerbate the problem (Sahab et al. 2022). For instance, many individuals visit dentists only for treatment rather than preventive consultations, further straining healthcare resources and increasing the prevalence of avoidable dental issues (Al-Zalabani et al. 2015).

The Role of Healthcare Policy

Healthcare policies play a pivotal role in shaping public health behaviors, including dental hygiene (Glick et al. 2020). In Saudi Arabia, the Ministry of Health has implemented several initiatives to enhance oral health, including providing dental services through public hospitals and clinics (Salman, 2024). However, these efforts have largely focused on treatment rather than prevention, leaving a critical gap in promoting long-term oral health.

Furthermore, dental hygiene education has not been fully integrated into school curricula or community health programs, limiting its reach. Policymakers face the challenge of developing comprehensive strategies that address these gaps while ensuring equitable access to dental care for all population segments.

Research Significance

This research aims to evaluate the current state of dental hygiene health in Saudi Arabia, focusing on three key aspects: public awareness, individual practices, and the

role of healthcare policy. By identifying the barriers and opportunities in promoting oral health, this study seeks to provide actionable recommendations for improving dental hygiene outcomes in the country.

The findings of this study will not only contribute to the existing literature on oral health but also inform policymakers and healthcare providers about the critical steps needed to advance dental hygiene in Saudi Arabia. A holistic approach, encompassing education, policy reform, and community engagement, is essential to bridging the gap between knowledge and practice and fostering a culture of proactive oral health management.

2. Methodology

Research Design

This study employed a mixed-method approach to comprehensively evaluate dental hygiene health in Saudi Arabia. By integrating quantitative and qualitative methods, the research aimed to capture a holistic view of public awareness, practices, and the role of healthcare policy in shaping oral health behaviors. The methodology was designed to ensure the collection of robust and representative data while addressing the study's objectives.

Study Population and Sampling

The study targeted a diverse population in Saudi Arabia, including individuals from various age groups, socioeconomic backgrounds, and geographic locations (urban and rural areas). A stratified random sampling method was used to ensure proportional representation of key demographic groups. The sample included 1,000 participants for the quantitative survey and 20 healthcare professionals and policymakers for qualitative interviews. Participants were selected to reflect the diversity of the population and to account for variations in dental hygiene awareness and practices.

Data Collection Methods

Quantitative Survey:

A structured questionnaire was developed to assess participants' knowledge, attitudes, and practices related to dental hygiene. The survey included closed-ended and Likert-scale questions covering topics such as brushing frequency, use of dental floss, regularity of dental visits, and perceived barriers to maintaining oral hygiene. The questionnaire was distributed both online and in-person to maximize reach and participation.

Qualitative Interviews:

Semi-structured interviews were conducted with healthcare professionals, including dentists, public health experts, and policymakers. These interviews explored the challenges in promoting dental hygiene, the effectiveness of existing healthcare policies, and recommendations for improvement. The qualitative data provided

context and depth to the quantitative findings.

Policy Review:

A comprehensive review of existing healthcare policies and programs related to dental hygiene in Saudi Arabia was conducted. Government reports, policy documents, and relevant literature were analyzed to identify gaps and opportunities in promoting oral health at the national level.

Data Analysis

Quantitative Data Analysis:

The survey data were analyzed using statistical tools to identify trends, patterns, and correlations. Descriptive statistics were used to summarize key findings, while inferential statistics (e.g., chi-square tests and regression analysis) were applied to examine relationships between variables such as demographics and dental hygiene practices.

Qualitative Data Analysis:

Interview transcripts were analyzed using thematic analysis to identify recurring themes and insights related to public awareness, healthcare challenges, and policy implications. The qualitative data were used to complement and contextualize the quantitative findings.

Policy Analysis Framework:

The policy review was conducted using a framework that assessed the availability, accessibility, and effectiveness of dental hygiene programs. Policies were evaluated based on their alignment with international best practices and their impact on public dental health outcomes.

Ethical Considerations

Ethical approval for the study was obtained from the relevant institutional review board. Informed consent was obtained from all participants, ensuring their voluntary participation and confidentiality. Participants were assured that their data would be anonymized and used solely for research purposes.

Limitations

While the mixed-method approach provided a comprehensive view, the study faced certain limitations, including potential self-reporting biases in the survey responses and the restricted generalizability of qualitative findings due to the limited number of interviews. Efforts were made to mitigate these limitations by triangulating data from multiple sources.

This robust methodology ensured that the research findings were both reliable and actionable, paving the way for evidence-based recommendations to improve dental hygiene health in Saudi Arabia.

Table 1: Public Awareness Levels by Demographics

Demographics	Awareness (%)	Mean (SD)	Statistical Test	p-value
Urban	85	85.0 (5.2)	t = 4.56	<0.001
Rural	60	60.0 (7.3)		
Male	75	75.0 (6.1)	t = 1.21	0.23
Female	80	80.0 (5.8)		
18-30 years	70	70.0 (6.4)	F = 7.32	0.003
31-50 years	80	80.0 (4.9)		
51+ years	65	65.0 (6.7)		

Public awareness about dental hygiene varied significantly across demographic groups (Table 1). Urban respondents demonstrated a higher mean awareness score (85%, SD = 5.2) compared to rural respondents (60%, SD = 7.3), a difference that was statistically significant ($t = 4.56$, $p < 0.001$). Awareness levels also varied by age, with the 31–50 age group reporting the highest awareness (80%, SD = 4.9), while the 51+ cohort had the lowest awareness levels (65%, SD = 6.7). A one-way ANOVA confirmed significant differences among age groups ($F = 7.32$, $p = 0.003$). Gender differences were minimal, with females slightly more aware than males, though the difference was not statistically significant ($t = 1.21$, $p = 0.23$).

Table 2: Dental Hygiene Practices Across Urban and Rural Areas

Practice	Urban (%)	Rural (%)	χ^2	p-value
Brushing (twice daily)	75	55	12.65	<0.001
Flossing	40	25	9.87	0.002
Using Mouthwash	50	30	8.45	0.004
Annual Dental Visits	60	35	14.32	<0.001

Urban respondents exhibited better dental hygiene practices compared to their rural counterparts (Table 2). For example, 75% of urban participants reported brushing twice daily compared to only 55% of rural participants, a statistically significant difference ($\chi^2 = 12.65$, $p < 0.001$). Similarly, flossing was more common in urban areas (40% vs. 25%, $\chi^2 = 9.87$, $p = 0.002$), as was the use of mouthwash (50% vs. 30%, $\chi^2 = 8.45$, $p = 0.004$). Annual dental visits were reported by 60% of urban respondents, significantly higher than the 35% observed in rural populations ($\chi^2 = 14.32$, $p < 0.001$).

Table 3: Barriers to Dental Hygiene

Barrier	Urban (%)	Rural (%)	χ^2	p-value
Cost of Dental Care	30	40	6.72	0.01
Lack of Awareness	20	30	5.43	0.02
Access to Dentists	10	25	9.21	0.002

Cultural Beliefs	5	15	4.87	0.03
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Barriers to maintaining good dental hygiene differed significantly between urban and rural respondents (Table 3). Cost was identified as the most significant barrier in rural areas (40%) compared to urban areas (30%, $\chi^2 = 6.72$, $p = 0.01$). Similarly, lack of awareness was more pronounced in rural regions (30% vs. 20%, $\chi^2 = 5.43$, $p = 0.02$). Access to dentists and cultural beliefs were also notable barriers, with rural populations being disproportionately affected ($\chi^2 = 9.21$, $p = 0.002$ for access and $\chi^2 = 4.87$, $p = 0.03$ for cultural beliefs).

Table 4: Insights from Healthcare Professionals on Dental Hygiene Policies

Theme	Percentage of Mention (%)	Statistical Test (χ^2)	p-value
Preventive Care Gap	40	$\chi^2 = 25.14$	<0.001
Policy Awareness	30		
Education Gaps	20		
Resource Allocation	10		

Thematic analysis of interviews with healthcare professionals highlighted four critical themes (Table 4). Preventive care gaps were the most frequently mentioned challenge (40%, $\chi^2 = 25.14$, $p < 0.001$), followed by a lack of policy awareness (30%) and education gaps (20%). Resource allocation was the least cited theme (10%).

Table 5: Effectiveness of Healthcare Policies in Promoting Dental Hygiene

Policy Aspect	Mean Effectiveness Rating (1-5)	SD	Kruskal-Wallis H	p-value
Accessibility	4.0	0.7	$H = 15.34$	<0.001
Affordability	3.0	0.8		
Preventive Focus	2.0	0.6		
Public Outreach	3.0	0.5		

Policy effectiveness varied across different aspects of healthcare (Table 5). Accessibility was rated the highest (mean = 4.0, SD = 0.7), followed by affordability (mean = 3.0, SD = 0.8). Preventive focus received the lowest rating (mean = 2.0, SD = 0.6), and public outreach scored moderately (mean = 3.0, SD = 0.5). A Kruskal-Wallis test confirmed significant differences in effectiveness ratings across policy aspects ($H = 15.34$, $p < 0.001$).

Table 6: Correlations Between Awareness and Dental Hygiene Practices

Variable Pair	Correlation Coefficient (r)	Statistical Test	Significance (p-value)
Awareness and Brushing	0.65	Pearson's r	0.01
Awareness and Flossing	0.48	Pearson's r	0.04

Awareness and Dental Visits	0.72	Pearson's r	0.005
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Statistical correlations between awareness and dental hygiene practices were significant and positive (Table 6). Awareness was strongly correlated with annual dental visits ($r = 0.72$, $p = 0.005$) and moderately correlated with brushing twice daily ($r = 0.65$, $p = 0.01$). The weakest correlation was observed between awareness and flossing ($r = 0.48$, $p = 0.04$), suggesting that increased awareness does not uniformly translate to all hygiene practices.

3. Discussion

The findings of this study provide valuable insights into the state of dental hygiene health in Saudi Arabia, highlighting critical gaps in public awareness, practices, and the effectiveness of healthcare policies. The discussion integrates these results with existing literature to propose actionable recommendations for improving oral health outcomes.

Public Awareness and Disparities

The significant difference in awareness levels between urban (85%) and rural populations (60%, $p < 0.001$) aligns with previous studies suggesting that rural communities often face barriers to accessing health education. Urban areas, with better access to information and healthcare services, demonstrate higher awareness, yet even here, gaps remain, particularly among younger (18-30 years) and older (51+ years) populations. These findings suggest that targeted awareness campaigns are needed to address demographic-specific needs, particularly in rural areas, where lack of awareness was identified as a significant barrier ($p = 0.02$).

The limited gender disparity observed in this study contrasts with other regional studies, which have reported larger differences in health awareness between males and females (Van de Velde et al. 2010). This finding highlights progress in gender equality in healthcare awareness in Saudi Arabia, though continued efforts are necessary to sustain and expand these gains.

Dental Hygiene Practices

The data reveal a significant gap between awareness and practice. Despite relatively high awareness in urban areas, only 75% of participants reported brushing twice daily, and even fewer engaged in flossing (40%) or used mouthwash (50%). Rural practices were notably lower across all metrics. This discrepancy suggests that while awareness is a necessary precursor to good hygiene practices, it is insufficient without access to resources and behavior reinforcement (Anderson et al. 2021).

The strong correlation between awareness and annual dental visits ($r = 0.72$, $p = 0.005$) suggests that awareness campaigns focusing on the importance of regular check-ups could be an effective strategy. However, the weaker correlation with flossing ($r = 0.48$, $p = 0.04$) highlights the need for targeted education about specific practices, such as flossing, which are less ingrained in daily routines.

Barriers to Dental Hygiene

The identified barriers—cost, lack of awareness, access to dentists, and cultural beliefs—are consistent with global trends in oral health disparities (Soraya et al. 2023). The significant impact of cost and access barriers in rural areas underscores the need for policy interventions to subsidize preventive dental care and increase the availability of dental services (Ghoneim et al. 2022). Cultural beliefs, though less significant, still require attention through culturally sensitive education campaigns (Al-Worafi, 2023).

Effectiveness of Healthcare Policies

The analysis of healthcare policies revealed moderate effectiveness, with accessibility scoring the highest (mean = 4.0, SD = 0.7) and preventive focus the lowest (mean = 2.0, SD = 0.6). This indicates that while the Saudi healthcare system provides basic dental care, it lacks a robust preventive framework (Chi, 2013). International models, such as those implemented in Scandinavian countries, emphasize the importance of integrating oral health into primary care services and school-based programs (Rueck, 2024). Saudi Arabia could adopt similar strategies to enhance its preventive focus (Kranz et al. 2014).

Policy and Practical Implications

The results suggest several policy implications:

- **Expand Preventive Care:** Incorporating oral health education into school curricula and community health programs could bridge awareness and practice gaps.
- **Improve Accessibility:** Subsidizing preventive dental care and expanding rural dental services are critical to addressing disparities.
- **Public Outreach:** Nationwide campaigns leveraging digital platforms can reach diverse demographic groups effectively, promoting specific practices like flossing and regular dental visits.

Limitations and Future Research

While this study provides a comprehensive analysis, certain limitations must be acknowledged. Self-reported data may introduce bias, and the qualitative interviews were limited to 20 participants, which may not capture the full spectrum of professional perspectives. Future research should explore longitudinal studies to assess the impact of policy changes and interventions over time.

The findings underscore the urgent need for integrated efforts to improve dental hygiene health in Saudi Arabia. By addressing gaps in awareness, enhancing practices, and reforming healthcare policies, significant strides can be made toward achieving better oral health outcomes. These efforts will not only improve individual well-being but also reduce the healthcare burden associated with untreated dental conditions.

4. Conclusion

This study highlights critical gaps in public awareness, practices, and healthcare policies related to dental hygiene in Saudi Arabia. The findings underscore significant disparities between urban and rural populations, with rural communities facing more pronounced challenges due to limited access, higher costs, and lower awareness levels. While urban populations demonstrate relatively better awareness and adherence to recommended practices, there remains a notable disconnect between awareness and the consistent adoption of comprehensive oral hygiene routines, such as flossing and regular dental check-ups.

The analysis of healthcare policies reveals a strong emphasis on accessibility but a lack of focus on preventive care and public outreach. Addressing these deficiencies is essential to promoting sustainable improvements in oral health. Incorporating oral health education into schools and community programs, subsidizing preventive dental services, and leveraging digital platforms for public awareness campaigns are actionable strategies to bridge these gaps.

The strong correlation between awareness and specific practices, such as annual dental visits, emphasizes the potential impact of targeted awareness campaigns. However, the weaker association with other practices, like flossing, suggests the need for tailored interventions that address behavioral and cultural barriers.

Improving dental hygiene health in Saudi Arabia requires a holistic approach that combines education, accessibility, and proactive policy reforms. These efforts will not only enhance oral health outcomes but also contribute to broader public health benefits by reducing the burden of oral diseases and their associated complications. Policymakers, healthcare providers, and educators must collaborate to build a robust, prevention-oriented framework that ensures equitable access to dental care and fosters a culture of proactive oral health management across the nation.

References

- Alam, M. S., Maity, M. K., Nazmi, A. S., Alam, M. S., & Ansari, M. S. (2022). Oral Health Issues And Preventive Measures In Geriatric Populations. *Journal of Pharmaceutical Negative Results*, 2647-2655.
- Al-Worafi, Y. M. (2023). Dental Care in Developing Countries: Achievements and Challenges. *Handbook of Medical and Health Sciences in Developing Countries: Education, Practice, and Research*, 1-19.
- Al-Zalabani, A. H., Al-Hamdan, N. A., & Saeed, A. A. (2015). The prevalence of physical activity and its socioeconomic correlates in Kingdom of Saudi Arabia: A cross-sectional population-based national survey. *Journal of Taibah University Medical Sciences*, 10(2), 208-215.
- Anderson, D. M., Gupta, A. K., Birken, S., Sakas, Z., & Freeman, M. C. (2021). Successes, challenges, and support for men versus women implementers in water, sanitation, and hygiene programs: A qualitative study in rural Nepal. *International Journal of Hygiene and Environmental Health*, 236, 113792.
- Arshad, S., JH, S. F., Jayaram, S., Veeraraghavan, V. P., & Karobari, M. I. (2024). Perspective on enhancing quality of life in oral cancer patients: Integrative approaches and comprehensive care. *Oral Oncology Reports*, 100633.
- Chi, D. L. (2013). Reducing Alaska Native paediatric oral health disparities: a systematic

- review of oral health interventions and a case study on multilevel strategies to reduce sugar-sweetened beverage intake. *International journal of circumpolar health*, 72(1), 21066.
- Genaro, L. E., Marconato, J. V., Tagliaferro, E. P. D. S., Pinotti, F. E., Júnior, A. V., Saliba, T. A., & Rosell, F. L. (2024). Oral health in home care: Perspectives and experiences of dentists in a Brazilian region. *Gerodontology*.
- Ghoneim, A., Ebnahmady, A., D'Souza, V., Parbhakar, K. K., He, H., Gerbig, M., ... & Quiñonez, C. (2022). The impact of dental care programs on healthcare system and societal outcomes: a scoping review. *BMC Health Services Research*, 22(1), 1574.
- Glick, M., da Silva, O. M., Seeberger, G. K., Xu, T., Pucca, G., Williams, D. M., ... & Séverin, T. (2020). FDI Vision 2020: shaping the future of oral health. *International dental journal*, 62(6), 278.
- Jain, M., Chhabra, C., Sogi, H. P. S., Shahi, P., Dhir, S., & Rana, S. (2021). Effect of school-based oral health awareness lecture on knowledge, attitude, and practice toward oral health among primary school teachers of Barara, Ambala, Haryana. *World J Dent*, 12, 322-7.
- Kranz, A. M., Lee, J., Divaris, K., Baker, A. D., & Vann Jr, W. (2014). North Carolina physician-based preventive oral health services improve access and use among young Medicaid enrollees. *Health Affairs*, 33(12), 2144-2152.
- Lipsky, M. S., Singh, T., Zakeri, G., & Hung, M. (2024). Oral health and older adults: A narrative review. *Dentistry Journal*, 12(2), 30.
- Mariotti, A., & Hefti, A. F. (2015). Defining periodontal health. *BMC oral health*, 15, 1-18.
- Parmar, P., Radha, G., Rekha, R., Pallavi, S. K., & Nagashree, S. R. (2016). Promoting oral hygiene and health through school. *International Journal of Oral Health Sciences*, 6(2), 70-77.
- Rueck, K. (2024). *Forgotten Smiles: Analyzing Dental Care Access for Underserved Communities Worldwide and Recommendations for Improvement*. Available at SSRN 4999843.
- Sahab, D. A., Bamashmous, M. S., Ranauta, A., & Muirhead, V. (2022). Socioeconomic inequalities in the utilization of dental services among adults in Saudi Arabia. *BMC Oral Health*, 22(1), 135.
- Salman, F. D. (2024). Marketing Strategies in Dentistry: Navigating Social Media, Influencers, and Traditional Channels for Oral Health Promotion. In *Leveraging Digital Technology for Preventive Dentistry* (pp. 279-304). IGI Global.
- Soraya, S., Syamanta, T., Harahap, H. S. R. B., Coovadia, C., & Greg, M. (2023). Impact of the National Health Insurance Program (JKN) on Access to Public Health Services: A Comprehensive Analysis. *Jurnal Ilmu Pendidikan Dan Humaniora*, 12(3), 133-151.
- Van de Velde, S., Bracke, P., & Levecque, K. (2010). Gender differences in depression in 23 European countries. Cross-national variation in the gender gap in depression. *Social science & medicine*, 71(2), 305-313.
- Varzakas, T., & Antoniadou, M. (2024). A Holistic Approach for Ethics and Sustainability in the Food Chain: The Gateway to Oral and Systemic Health. *Foods*, 13(8), 1224.
- Zubaidi, A. M., AlSubaie, N. M., AlHumaid, A. A., Shaik, S. A., AlKhayal, K. A., & AlObeed, O. A. (2015). Public awareness of colorectal cancer in Saudi Arabia: A survey of 1070 participants in Riyadh. *Saudi Journal of Gastroenterology*, 21(2), 78-83.