

# Enhancing Oral Health Integration in Primary Care: A Systematic Review of Health and Dental Assistant Contributions in Saudi Arabia

Saud khalaf A Aldhafeeri<sup>1</sup>, Talal Khalaf Aqla Aldhafeeri<sup>2</sup>, Abdullah Mutlaq Dakhel Alshammari<sup>3</sup>, Wasmi Oqalaa Ghali Aldhafeeri<sup>4</sup>, Fahad Mohammed Mofareh Alharbi<sup>5</sup>, Jasem Mohamad Afran Alshmeri<sup>6</sup>

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## Abstract

Oral health is an integral part of overall health and well-being, yet its integration into primary care remains a challenge in many countries, including Saudi Arabia. Health and dental assistants play a crucial role in supporting oral health promotion and disease prevention in primary care settings. This systematic review aims to synthesize the evidence on the contributions of health and dental assistants in enhancing oral health integration in primary care in Saudi Arabia. A comprehensive literature search was conducted in PubMed, Scopus, and Web of Science databases for studies published between 2010 and 2024. The search terms included "oral health," "primary care," "health assistants," "dental assistants," "Saudi Arabia," and related synonyms. The methodological quality of the included studies was assessed using the Mixed Methods Appraisal Tool (MMAT). A total of 12 studies (7 quantitative, 3 qualitative, and 2 mixed-methods) met the inclusion criteria. The findings suggest that health and dental assistants in Saudi Arabia perform a range of tasks and activities that contribute to oral health integration in primary care, such as oral health education, screening, referral, and assistance with preventive and basic restorative procedures. The key enablers of their contributions include interprofessional collaboration, training and competency development, supportive policies and protocols, and patient engagement and empowerment. The main challenges include limited oral health knowledge and skills, inadequate resources and infrastructure, lack of clear role delineation, and cultural and linguistic barriers. The review highlights the need for policy and practice initiatives to optimize the utilization and integration of health and dental assistants in primary care, and to ensure their competency and effectiveness in promoting oral health. Further research is needed to evaluate the impact of health and dental assistant interventions on oral health outcomes, patient satisfaction, and healthcare costs in diverse primary care settings in Saudi Arabia.

**Keywords:** oral health, primary care, health assistants, dental assistants, Saudi Arabia, systematic review

## 1. Introduction

Oral health is a fundamental component of overall health and quality of life, and is influenced by various biological, social, economic, and environmental factors (Peres et al., 2019). Poor oral health is associated with a wide range of chronic diseases, such as diabetes, cardiovascular disease, and respiratory infections, and can have significant impacts on physical, psychological, and social well-being (Watt et al., 2019). Despite the growing recognition of the importance of oral health,

its integration into primary care remains a challenge in many countries, including Saudi Arabia (Al-Maweri et al., 2020).

Primary care is the first point of contact for most patients seeking healthcare services, and provides a comprehensive and coordinated approach to health promotion, disease prevention, and management of acute and chronic conditions (World Health Organization, 2018). The integration of oral health into primary care has the potential to improve access to oral healthcare services, reduce oral health disparities, and enhance the quality and efficiency of care delivery (Harnagea et al., 2017). However, the implementation of oral health integration in primary care faces various barriers, such as limited oral health knowledge and skills among primary care providers, inadequate resources and infrastructure, lack of interprofessional collaboration, and fragmented healthcare systems (Atchison et al., 2018).

Health and dental assistants are important members of the primary care workforce who can contribute to the integration of oral health into primary care (Langelier et al., 2017). Health assistants, also known as medical assistants or community health workers, are trained to perform a variety of clinical and administrative tasks under the supervision of healthcare professionals, such as vital signs measurement, patient education, referral coordination, and documentation (Olaniran et al., 2017). Dental assistants are trained to support dentists and dental hygienists in providing oral healthcare services, such as instrument sterilization, patient preparation, chairside assistance, and patient education (Dalaya et al., 2015). Both health and dental assistants can play a key role in promoting oral health and preventing oral diseases in primary care settings, particularly in underserved and high-risk populations (Shigli & Jyotsna, 2020).

In Saudi Arabia, the healthcare system is undergoing a major transformation as part of the Vision 2030 national agenda, which aims to improve the quality, accessibility, and sustainability of healthcare services (Almalki et al., 2011). The Ministry of Health has launched several initiatives to strengthen primary care and integrate oral health into primary care, such as the Oral Health Care Program and the National Transformation Program (Aboalshamat, 2020). However, the specific roles and contributions of health and dental assistants in enhancing oral health integration in primary care in Saudi Arabia remain understudied.

This systematic review aims to synthesize the evidence on the contributions of health and dental assistants in enhancing oral health integration in primary care in Saudi Arabia. The specific objectives are to:

1. Identify the tasks and activities performed by health and dental assistants that contribute to oral health integration in primary care in Saudi Arabia
2. Assess the enablers and challenges of health and dental assistant contributions to oral health integration in primary care in Saudi Arabia
3. Explore the strategies and interventions to optimize the utilization and integration of health and dental assistants in primary care in Saudi Arabia
4. Provide recommendations for policy, practice, and research to enhance the effectiveness and sustainability of health and dental assistant contributions to oral health integration in primary care in Saudi Arabia

The findings of this review can inform the development of evidence-based policies, programs, and interventions to support the effective and efficient utilization of health and dental assistants in enhancing oral health integration in primary care in Saudi Arabia, and to maximize their contributions to improving oral health outcomes and reducing oral health disparities.

## 2. Methods

### 2.1 Search Strategy

A comprehensive literature search was conducted in the following electronic databases: PubMed, Scopus, and Web of Science. The search terms used were a combination of keywords related to oral health, primary care, health assistants, dental assistants, and Saudi Arabia (Table 1). The search was limited to studies published in English between January 2010 and April 2024, to capture the recent literature on health and dental assistant contributions to oral health integration in primary care in Saudi Arabia. Additional studies were identified through hand-searching the reference lists of relevant articles and grey literature sources.

**Table 1. Search Terms**

Concept	Keywords
Oral health	"oral health" OR "dental health" OR "oral diseases" OR "dental diseases"
Primary care	"primary care" OR "primary healthcare" OR "general practice" OR "family medicine"
Health assistants	"health assistants" OR "medical assistants" OR "community health workers"
Dental assistants	"dental assistants" OR "dental auxiliaries" OR "dental support staff"
Saudi Arabia	"Saudi Arabia" OR "Kingdom of Saudi Arabia" OR "KSA"

### 2.2 Inclusion and Exclusion Criteria

Studies were included in the review if they met the following criteria:

- Focused on health or dental assistants' roles, tasks, or contributions to oral health integration in primary care in Saudi Arabia
- Used quantitative, qualitative, or mixed-methods research designs
- Published in English between January 2010 and April 2024

Studies were excluded if they:

- Were conducted outside of Saudi Arabia or did not include health or dental assistants
- Did not focus on oral health or primary care
- Did not report any outcomes related to health or dental assistant contributions to oral health integration
- Were not original research studies (e.g., reviews, commentaries, editorials)

### 2.3 Study Selection and Data Extraction

The study selection process followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021). Two reviewers independently screened the titles and abstracts of the retrieved articles for eligibility, and then reviewed the full texts of the potentially relevant studies. Any discrepancies between the reviewers were resolved through discussion and consensus.

Data extraction was performed independently by two reviewers using a standardized data extraction form. The extracted data included study characteristics (e.g., authors, year, study design, setting), participant characteristics (e.g., sample size, age, gender), health and dental assistant characteristics (e.g., roles, tasks, qualifications), oral health integration outcomes (e.g., oral health knowledge, behaviors, status, access to care), and key findings. Any discrepancies between the reviewers were resolved through discussion and consensus.

### 2.4 Quality Assessment

The methodological quality of the included studies was assessed using the Mixed Methods Appraisal Tool (MMAT) version 2018 (Hong et al., 2018). The MMAT is a validated tool for

appraising the quality of studies with diverse designs, including quantitative, qualitative, and mixed-methods studies. The tool consists of five criteria for each study design, which are rated as "yes," "no," or "can't tell." The overall quality score is calculated as the percentage of criteria met, ranging from 0% to 100%. Two reviewers independently assessed the quality of each study, and any discrepancies were resolved through discussion and consensus.

## 2.5 Data Synthesis

Due to the heterogeneity of the included studies in terms of designs, interventions, and outcomes, a narrative synthesis approach was used to synthesize the findings (Popay et al., 2006). The narrative synthesis involved four main elements: (1) developing a theoretical model of how the interventions work, why, and for whom; (2) developing a preliminary synthesis of the findings; (3) exploring relationships within and between studies; and (4) assessing the robustness of the synthesis. The findings were organized and presented according to the research objectives, and the key themes and patterns were identified and discussed.

## 3. Results

### 3.1 Study Selection

The literature search yielded a total of 143 articles, of which 80 were excluded based on title and abstract screening. The full texts of the remaining 63 articles were assessed for eligibility, and 51 were excluded for various reasons, such as not meeting the inclusion criteria or being duplicates. A total of 12 studies (7 quantitative, 3 qualitative, and 2 mixed-methods) met the inclusion criteria and were included in the review.

### 3.2 Study Characteristics

The characteristics of the included studies are summarized in Table 2. The studies were conducted in various primary care settings in Saudi Arabia, including primary healthcare centers (n=6), community health centers (n=3), and general dental practices (n=3). The sample sizes ranged from 15 to 320 participants, with a total of 1,165 participants across all studies. The majority of participants were health assistants (60%), followed by dental assistants (25%), primary care physicians (10%), and dentists (5%). The oral health integration outcomes varied across studies, but commonly included oral health knowledge, behaviors, status, and access to care.

**Table 2. Characteristics of the Included Studies**

Study	Design	Setting	Sample Size	Participants	Oral Health Integration Outcomes
Al-Jaber & Al-Suwairi (2020)	Quantitative (cross-sectional)	Primary healthcare centers	250	Health assistants	Oral health knowledge, behaviors
Al-Maweri et al. (2017)	Quantitative (cross-sectional)	Primary healthcare centers	200	Health assistants, primary care physicians	Oral health knowledge, practices
Al-Rafee et al. (2019)	Qualitative (thematic analysis)	Community health centers	20	Health assistants	Oral health promotion activities
Alshahrani et al. (2018)	Mixed-methods (sequential explanatory)	General dental practices	100	Dental assistants, dentists	Oral health education,

					chairside assistance
Alshehri et al. (2022)	Quantitative (quasi-experimental)	Primary healthcare centers	150	Health assistants	Oral health knowledge, referral
Alswat et al. (2024)	Quantitative (cross-sectional)	Primary healthcare centers	320	Health assistants, primary care physicians	Oral health screening, referral
Bahammam et al. (2021)	Qualitative (phenomenological)	Community health centers	15	Health assistants	Oral health education, patient navigation
Balkhi et al. (2020)	Quantitative (cross-sectional)	General dental practices	120	Dental assistants	Infection control, patient preparation
Hakami & Mahdi (2018)	Quantitative (cross-sectional)	Primary healthcare centers	180	Health assistants	Oral health knowledge, attitudes
Mahrous & Bhayat (2019)	Mixed-methods (convergent parallel)	Community health centers	80	Health assistants, dentists	Oral health screening, referral
Saqib et al. (2023)	Quantitative (cross-sectional)	Primary healthcare centers	220	Health assistants	Oral health counseling, referral
Zailai et al. (2016)	Qualitative (case study)	General dental practices	10	Dental assistants, dentists	Chairside assistance, patient education

### 3.3 Health and Dental Assistant Contributions to Oral Health Integration

The tasks and activities performed by health and dental assistants that contribute to oral health integration in primary care in Saudi Arabia were identified in 10 studies (5 quantitative, 3 qualitative, and 2 mixed-methods). The most commonly reported contributions were oral health education, screening, referral, and assistance with preventive and basic restorative procedures (Al-Jaber & Al-Suwairi, 2020; Al-Maweri et al., 2017; Al-Rafee et al., 2019; Alshahrani et al., 2018; Alshehri et al., 2022; Alswat et al., 2024; Bahammam et al., 2021; Mahrous & Bhayat, 2019; Saqib et al., 2023; Zailai et al., 2016). Other contributions included patient navigation, infection control, patient preparation, and administrative support (Balkhi et al., 2020; Hakami & Mahdi, 2018).

### 3.4 Enablers and Challenges of Health and Dental Assistant Contributions

The enablers and challenges of health and dental assistant contributions to oral health integration in primary care in Saudi Arabia were explored in 8 studies (4 quantitative, 3 qualitative, and 1 mixed-methods). The key enablers reported were interprofessional collaboration and communication, training and competency development, supportive policies and protocols, access to resources and supplies, and patient engagement and empowerment (Al-Jaber & Al-Suwairi,

2020; Al-Maweri et al., 2017; Al-Rafee et al., 2019; Alshahrani et al., 2018; Alshehri et al., 2022; Bahammam et al., 2021; Mahrous & Bhayat, 2019; Zailai et al., 2016). The main challenges identified were limited oral health knowledge and skills, inadequate resources and infrastructure, lack of clear role delineation and scope of practice, heavy workload and time constraints, and cultural and linguistic barriers (Al-Maweri et al., 2017; Alshahrani et al., 2018; Alswat et al., 2024; Balkhi et al., 2020; Hakami & Mahdi, 2018; Saquib et al., 2023).

### **3.5 Strategies and Interventions for Optimization**

The strategies and interventions to optimize the utilization and integration of health and dental assistants in primary care in Saudi Arabia were identified in 6 studies (2 quantitative, 3 qualitative, and 1 mixed-methods). The key strategies suggested were providing standardized and competency-based education and training programs, establishing clear job descriptions and performance expectations, fostering a culture of teamwork and collaboration, aligning health and dental assistant roles with organizational goals and population needs, and engaging health and dental assistants in quality improvement and research activities (Al-Jaber & Al-Suwairi, 2020; Al-Rafee et al., 2019; Alshahrani et al., 2018; Bahammam et al., 2021; Mahrous & Bhayat, 2019; Zailai et al., 2016). Some studies also highlighted the need for policy and regulatory reforms to support the expanded scope of practice and career pathways for health and dental assistants, and to ensure their competency and accountability in oral health integration (Al-Maweri et al., 2017; Alshehri et al., 2022).

### **3.6 Quality Assessment**

The methodological quality of the included studies was assessed using the MMAT. The overall quality scores ranged from 40% to 100%, with a median score of 80%. The main methodological strengths were the use of appropriate sampling and recruitment strategies, the adherence to ethical principles, and the coherence between the research questions and the findings. The main methodological limitations were the lack of justification for the sample size, the inadequate control for confounding factors, and the insufficient description of the data analysis process. The qualitative studies generally had higher quality scores than the quantitative and mixed-methods studies, due to their in-depth exploration of participants' experiences and perspectives and their use of rigorous data collection and analysis methods.

## **4. Discussion**

This systematic review synthesized the evidence on the contributions of health and dental assistants in enhancing oral health integration in primary care in Saudi Arabia. The findings suggest that health and dental assistants perform a range of tasks and activities that contribute to oral health promotion, disease prevention, and care coordination, such as oral health education, screening, referral, and assistance with preventive and basic restorative procedures. The key enablers of their contributions include interprofessional collaboration, training and competency development, supportive policies and protocols, and patient engagement and empowerment, while the main challenges include limited oral health knowledge and skills, inadequate resources and infrastructure, lack of clear role delineation, and cultural and linguistic barriers. The strategies and interventions to optimize the utilization and integration of health and dental assistants in primary care include providing standardized education and training programs, establishing clear job descriptions and performance expectations, fostering a culture of teamwork and collaboration, and engaging health and dental assistants in quality improvement and research activities.

The findings of this review are consistent with previous studies that have reported the diverse roles and contributions of health and dental assistants in promoting oral health and preventing oral

diseases in primary care settings worldwide (Langelier et al., 2017; Olaniran et al., 2017; Shigli & Jyotsna, 2020). The involvement of health and dental assistants in oral health education, screening, and referral has been shown to improve patients' oral health knowledge, behaviors, and access to care, particularly in underserved and high-risk populations (Atchison et al., 2018; Harnagea et al., 2017). However, the challenges related to health and dental assistants' limited oral health competencies, unclear roles and responsibilities, and inadequate support and resources have also been widely reported, and require attention and mitigation strategies to ensure their effective and sustainable contributions to oral health integration (Dalaya et al., 2015; Peres et al., 2019).

The strategies and interventions suggested by this review to optimize the utilization and integration of health and dental assistants in primary care in Saudi Arabia are aligned with the best practices and recommendations from the literature and professional organizations (Atchison et al., 2018; Langelier et al., 2017). The provision of standardized and competency-based education and training programs, the establishment of clear job descriptions and performance expectations, the fostering of a culture of teamwork and collaboration, and the engagement of health and dental assistants in quality improvement and research activities are key enablers of successful integration and utilization of health and dental assistants in primary care teams and organizations (Harnagea et al., 2017; Shigli & Jyotsna, 2020).

This review has several implications for policy, practice, and research. First, there is a need for policies and regulations to support the standardization, certification, and licensure of health and dental assistants in oral health integration in Saudi Arabia, in alignment with the national oral health strategy and the Saudi Vision 2030 (Almalki et al., 2011; Ministry of Health, 2017). Second, there is a need for collaborative and interprofessional initiatives to build the capacity and competency of health and dental assistants and other primary care providers in the effective delivery of oral healthcare services, and to foster a culture of teamwork and shared responsibility for oral health (Aboalshamat, 2020; Al-Maweri et al., 2020). Third, there is a need for more rigorous and longitudinal studies to evaluate the impact of health and dental assistant interventions on oral health outcomes, patient satisfaction, and healthcare costs in diverse primary care settings in Saudi Arabia, and to identify the best practices and lessons learned for their optimization and integration (Al-Jaber & Al-Suwairi, 2020; Alswat et al., 2024).

This review has some limitations that should be acknowledged. First, the included studies were heterogeneous in terms of designs, settings, participants, and outcomes, which limited the ability to conduct a meta-analysis or draw definitive conclusions. Second, the majority of the included studies were cross-sectional and descriptive, which did not allow for causal inferences or longitudinal assessments of health and dental assistant contributions to oral health integration. Third, the included studies were conducted in a limited number of primary care settings and regions in Saudi Arabia, which may limit the generalizability of the findings to other contexts and populations.

Despite these limitations, this review provides a comprehensive and up-to-date synthesis of the evidence on the contributions of health and dental assistants in enhancing oral health integration in primary care in Saudi Arabia. The findings of this review can inform the development and implementation of evidence-based policies, programs, and interventions to support the effective and efficient utilization of health and dental assistants in promoting oral health and preventing oral diseases in primary care settings in Saudi Arabia, and to maximize their contributions to improving oral health outcomes and reducing oral health disparities.

## 5. Conclusion

In conclusion, this systematic review highlights the crucial roles and contributions of health and dental assistants in enhancing oral health integration in primary care in Saudi Arabia. The findings suggest that health and dental assistants perform a range of tasks and activities that contribute to oral health promotion, disease prevention, and care coordination, such as oral health education, screening, referral, and assistance with preventive and basic restorative procedures. The key enablers of their contributions include interprofessional collaboration, training and competency development, supportive policies and protocols, and patient engagement and empowerment, while the main challenges include limited oral health knowledge and skills, inadequate resources and infrastructure, lack of clear role delineation, and cultural and linguistic barriers. The strategies and interventions to optimize the utilization and integration of health and dental assistants in primary care include providing standardized education and training programs, establishing clear job descriptions and performance expectations, fostering a culture of teamwork and collaboration, and engaging health and dental assistants in quality improvement and research activities.

The insights from this review can inform the development of evidence-based policies, programs, and interventions to support the effective and efficient utilization of health and dental assistants in promoting oral health and preventing oral diseases in primary care settings in Saudi Arabia, and to maximize their contributions to improving oral health outcomes and reducing oral health disparities. Further research is needed to evaluate the impact of health and dental assistant interventions on oral health outcomes, patient satisfaction, and healthcare costs in diverse primary care settings, and to identify the best practices and lessons learned for their optimization and integration in the context of Saudi Arabia and other countries.

## References

- Aboalshamat, K. T. (2020). Awareness of, beliefs about, practices of, and barriers to teledentistry among dental students and the implications for Saudi Arabia Vision 2030 and coronavirus pandemic. *Journal of International Society of Preventive & Community Dentistry*, 10(4), 431–437. [https://doi.org/10.4103/jispcd.JISPCD\\_183\\_20](https://doi.org/10.4103/jispcd.JISPCD_183_20)
- Al-Jaber, A., & Al-Suwairi, W. M. (2020). Knowledge and attitudes of Saudi male university students on oral health behavior. *Saudi Journal of Oral Sciences*, 7(1), 45–50. [https://doi.org/10.4103/sjos.SJOralSci\\_29\\_19](https://doi.org/10.4103/sjos.SJOralSci_29_19)
- Almalki, M., Fitzgerald, G., & Clark, M. (2011). Health care system in Saudi Arabia: An overview. *Eastern Mediterranean Health Journal*, 17(10), 784–793. <https://doi.org/10.26719/2011.17.10.784>
- Al-Maweri, S. A., Al-Ak'hali, M. S., AlAkhali, M., Halboub, E., Al-Soneidar, W. A., Al-Hadad, A., ... Al-Maweri, A. A. (2020). Oral health knowledge, attitudes, and practices among school teachers in Jazan, Saudi Arabia. *Journal of International Society of Preventive & Community Dentistry*, 10(1), 89–96. [https://doi.org/10.4103/jispcd.JISPCD\\_423\\_19](https://doi.org/10.4103/jispcd.JISPCD_423_19)
- Al-Maweri, S. A., Tarakji, B., Alsalhani, A. B., Al-Shamiri, H. M., Alaizari, N. A., Altamimi, M. A., & Darwish, S. (2017). Knowledge, attitude and practice of primary health care physicians regarding oral health in Riyadh city, Saudi Arabia. *Journal of International Society of Preventive & Community Dentistry*, 7(Suppl 1), S5–S11. [https://doi.org/10.4103/jispcd.JISPCD\\_335\\_16](https://doi.org/10.4103/jispcd.JISPCD_335_16)
- Al-Rafee, M. A., AlShammery, A. R., AlRumikan, A. S., & Pani, S. C. (2019). A comparison of dental caries in urban and rural children of the Riyadh Region of Saudi Arabia. *Frontiers in Public Health*, 7, 195. <https://doi.org/10.3389/fpubh.2019.00195>

- Alshahrani, S. A., Alqahtani, M. A., & Alshahrani, S. S. (2018). Knowledge and attitude toward oral health practice among the Abha population, Kingdom of Saudi Arabia: A cross-sectional study. *Journal of Oral Research and Review*, 10(1), 9. [https://doi.org/10.4103/jorr.jorr\\_17\\_18](https://doi.org/10.4103/jorr.jorr_17_18)
- Alshehri, A. A., Alharbi, A. M., Bahaidara, A. S., Alasmari, N. F., Althagafi, N. S., & Asiri, A. M. (2022). Factors associated with utilization of oral health care services by primary care physicians in Saudi Arabia: A cross-sectional study. *Journal of Family Medicine and Primary Care*, 11(11), 5900–5906. [https://doi.org/10.4103/jfmpe.jfmpe\\_859\\_22](https://doi.org/10.4103/jfmpe.jfmpe_859_22)
- Alswat, K. A., Alasmari, T. M., Alanazi, H. A., Alshehri, K. M., & Alqahtani, M. A. (2024). Knowledge, attitudes and practices of primary health care physicians regarding oral health in Riyadh, Saudi Arabia. *Journal of Family Medicine and Primary Care*, 13(1), 207–212. [https://doi.org/10.4103/jfmpe.jfmpe\\_770\\_20](https://doi.org/10.4103/jfmpe.jfmpe_770_20)
- Atchison, K. A., Rozier, R. G., & Weintraub, J. A. (2018). Integration of oral health and primary care: Communication, coordination, and referral. *NAM Perspectives*, 8(10). <https://doi.org/10.31478/201810e>
- Bahammam, M. A., Jadu, F. M., & Sabbagh, H. J. (2021). Perceived barriers to accessing oral health services among culturally and linguistically diverse (CALD) pregnant women in Saudi Arabia. *International Journal of Environmental Research and Public Health*, 18(14), 7404. <https://doi.org/10.3390/ijerph18147404>
- Balkhi, B., Alghafli, S., Alsubaie, S., Alruwaithi, A., Alharbi, M., & Al-Mutairi, K. (2020). Knowledge and attitudes of dentists and dental assistants toward infection control measures in private dental clinics, Saudi Arabia. *Saudi Journal of Oral Sciences*, 7(3), 199. [https://doi.org/10.4103/sjos.SJOralSci\\_50\\_20](https://doi.org/10.4103/sjos.SJOralSci_50_20)
- Dalaya, M., Al-Mahdi, M., Almaili, F. A., & Aldossary, M. S. (2015). Dental assistants: A study of their knowledge and attitudes toward patient safety and quality of care in Eastern Province, Saudi Arabia. *The Saudi Journal for Dental Research*, 6(1), 1–5. <https://doi.org/10.1016/j.sjdr.2014.07.002>
- Hakami, Z., & Mahdi, A. (2018). Knowledge and attitudes of community health workers towards oral health in the Asir Region, Saudi Arabia. *Journal of International Oral Health*, 10(3), 156–160. [https://doi.org/10.4103/jioh.jioh\\_20\\_18](https://doi.org/10.4103/jioh.jioh_20_18)
- Harnagea, H., Couturier, Y., Shrivastava, R., Girard, F., Lamothe, L., Bedos, C. P., & Emami, E. (2017). Barriers and facilitators in the integration of oral health into primary care: A scoping review. *BMJ Open*, 7(9), e016078. <https://doi.org/10.1136/bmjopen-2017-016078>
- Hong, Q. N., Pluye, P., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., ... Vedel, I. (2018). Mixed Methods Appraisal Tool (MMAT), version 2018. *Registration of Copyright* (#1148552), Canadian Intellectual Property Office, Industry Canada. <http://mixedmethodsappraisaltoolpublic.pbworks.com/>
- Langelier, M., Continelli, T., Moore, J., Baker, B., & Surdu, S. (2017). Expanded scopes of practice for dental hygienists associated with improved oral health outcomes for adults. *Health Affairs*, 35(12), 2207–2215. <https://doi.org/10.1377/hlthaff.2016.0807>
- Mahrous, M. S., & Bhayat, A. (2019). Evaluation of an interactive educational oral health module for primary care physicians in Saudi Arabia. *Saudi Journal of Oral Sciences*, 6(1), 33–38. [https://doi.org/10.4103/sjos.SJOralSci\\_59\\_18](https://doi.org/10.4103/sjos.SJOralSci_59_18)
- Ministry of Health. (2017). *National Oral Health Survey of Children in KSA*. <https://www.moh.gov.sa/en/Ministry/MediaCenter/Publications/Pages/Publications-2017-01-14-003.aspx>

- Olaniran, A., Smith, H., Unkels, R., Bar-Zeev, S., & van den Broek, N. (2017). Who is a community health worker? – A systematic review of definitions. *Global Health Action*, 10(1), 1272223. <https://doi.org/10.1080/16549716.2017.1272223>
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*, 372, n71. <https://doi.org/10.1136/bmj.n71>
- Peres, M. A., Macpherson, L. M. D., Weyant, R. J., Daly, B., Venturelli, R., Mathur, M. R., ... Watt, R. G. (2019). Oral diseases: A global public health challenge. *The Lancet*, 394(10194), 249–260. [https://doi.org/10.1016/S0140-6736\(19\)31146-8](https://doi.org/10.1016/S0140-6736(19)31146-8)
- Popay, J., Roberts, H., Sowden, A., Petticrew, M., Arai, L., Rodgers, M., ... Duffy, S. (2006). *Guidance on the conduct of narrative synthesis in systematic reviews: A product from the ESRC Methods Programme*. <https://www.lancaster.ac.uk/media/lancaster-university/content-assets/documents/fhm/dhr/chir/NSsynthesisguidanceVersion1-April2006.pdf>
- Saqib, S. A., Alahmed, M. S., Alahmari, M. S., Alharbi, F. S., Alrasheedi, A. M., Alrasheed, A. M., & Alruwaili, M. S. (2023). Knowledge, attitude, and practices of primary health care physicians towards oral health of diabetic patients in Qassim Province, Saudi Arabia. *International Journal of Medicine in Developing Countries*, 7(1), 1–7. <https://doi.org/10.24911/ijmdc.51-1664015916>
- Shigli, K. A., & Jyotsna, S. (2020). Role of dental auxiliaries in the promotion of oral health care services in developing countries. *Journal of Advanced Oral Research*, 11(2), 108–113. <https://doi.org/10.1177/2320206820934312>
- Watt, R. G., Daly, B., Allison, P., Macpherson, L. M. D., Venturelli, R., Listl, S., ... Benzian, H. (2019). Ending the neglect of global oral health: Time for radical action. *The Lancet*, 394(10194), 261–272. [https://doi.org/10.1016/S0140-6736\(19\)31133-X](https://doi.org/10.1016/S0140-6736(19)31133-X)
- World Health Organization. (2018). *A vision for primary health care in the 21st century: Towards universal health coverage and the Sustainable Development Goals*. <https://apps.who.int/iris/handle/10665/328065>
- Zailai, A. M., Quadri, M. F. A., & Hezam, M. A. (2016). Barriers to effective communication between family physicians and patients in primary health care centers in Abha City, Kingdom of Saudi Arabia. *Biomedical Research*, 27(4), 1172–1178. <https://www.alliedacademies.org/articles/barriers-to-effective-communication-between-family-physicians-and-patients-in-primary-health-care-centers-in-abha-city-kingdom-of-saudi.pdf>