A review of oral health promotion programmes in Eastern Mediterranean Region

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Abstract

Background: Oral health conditions, such as dental caries, periodontal disease, tooth loss, dental fluorosis, dental trauma, and oral cancer, are prevalent in the WHO Eastern Mediterranean Region. However, there has been no systematic review of oral health promotion interventions in the region.

Aims: To review existing literature on oral health promotion programmes in the Eastern Mediterranean Region and recommend improvements for the future.

Method: We reviewed on PubMed and Google Scholar 61 articles published in the Eastern Mediterranean Region between 2010 and 2023. Quality assessment of included studies was performed using established criteria. We used the content analysis approach to create appropriate themes from the studies and to document meaningful conclusions about oral health promotion.

Results: Majority of the studies were cross-sectional, a few were randomized controlled, quasi-experimental, longitudinal studies, or reviews. Oral health problems identified included poor oral health knowledge, dental caries, periodontal disease, tooth loss, dental fluorosis, and oral cancer. Although oral disorders were common in most of the countries, very few have implemented oral health promotion programmes.

Conclusion: We recommend prioritization of oral health promotion programmes in the Eastern Mediterranean Region to tackle the diverse oral health challenges. To be effective, such programmes should be region- and context-specific. More studies on oral health promotion are needed in the region.

Keywords: Oral health, dental caries, periodontal disease, tooth loss, dental fluorosis, dental trauma, oral cancer, Eastern Mediterranean

Introduction

The WHO Eastern Mediterranean Region (EMR) comprises 22 countries and territories and is home to nearly 679 million people. The region is one of the most diverse geographically under WHO’s mandate, despite many cultural, social, religious, linguistic and culinary similarities. While some countries with high incomes and robust healthcare systems, such as Morocco, Oman, Qatar, the Kingdom of Saudi Arabia, and the United Arab Emirates, stand out, others like Djibouti, Pakistan, and Sudan face challenges with their healthcare systems (1). In recent years, Middle Eastern nations such as Iraq, Libya, State of Palestine, Syrian Arab Republic, and Yemen have experienced escalating conflicts, further straining their healthcare infrastructure.

Dental caries and periodontal diseases are highly prevalent in all EMR countries (2). Oral health challenges persist in the region, necessitating targeted preventive measures. Addressing oral healthcare challenges is paramount, and comprehending the region’s unique challenges is crucial for promptly implementing tailored strategies and interventions.

In 2021, WHO adopted a landmark resolution to prioritize and establish oral health as part of Universal Health Coverage (4). In the EMR, this resolution facilitated an increased focus on oral health promotion and oral disease prevention programmes. We believe it is important to carefully review past programmes and interventions to facilitate documentation and replication of best practice programmes or develop new ones. The WHO country area profile programme database provides insights into oral health and dental caries prevalence among WHO Member States. However, the database has limitations. Not all Member States have registered their oral health data, and even when available, updates are not consistently provided (3).

Our aim was to review existing literature on oral health programmes and make recommendations based on best practices to improve oral health promotion and oral disease prevention programmes in the region in the future.

Methods

Literature search

We used a comprehensive and objective approach to search for literature in the PubMed and Google Scholar databases.
databases to identify any relevant articles on the research topic. The keywords used were “oral health”, “oral disease prevention programs”, “Eastern Mediterranean Region”, and “WHO Eastern Mediterranean region (Afghanistan, Bahrain, Djibouti, Egypt, the Islamic Republic of Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Occupied Palestinian Territory, Oman, Pakistan, Qatar, Saudi Arabia, Somalia, Sudan, Syria Arab republic, Tunisia, United Arab Emirates, Yemen)”. Boolean operators “AND” and “OR” was used to combine the search terms.

**Inclusion criteria and literature selection**

We only considered articles or studies published between 2010 and 2023 for inclusion in our study. We chose this 13-year time frame to ensure that the data was current enough to be relevant to oral health data, interventions and prevention programmes in the region. We considered all types of studies on oral health for inclusion in our study such as cross-sectional, observational, qualitative, quantitative, systematic reviews and randomized control trials (RCTs), among others, for review. We only included articles that were published in the English language and focused on EMR.

Studies or articles conducted to evaluate oral health and oral health programmes worldwide, studies not from Eastern Mediterranean countries, and non-peer-reviewed such as grey literature articles were not considered. We also excluded short research communications, letters to editors, blogs or magazine articles, other non-academic materials and articles without open access to full text.

Two of the authors screened all 311 retrieved articles and selected articles for review independently. Any disparities were discussed and resolved. When needed, the third author was consulted until a consensus was achieved.

The screening process involved a multi-stage approach. An initial screening was conducted to exclude 44 articles which were duplicates. In the next stage 100 articles not meeting the inclusion criteria were excluded. After screening of titles and abstracts 80 articles were excluded. The remaining 87 articles were screened for eligibility. Finally, 61 articles qualified to be included in our review (Figure 1).

**Data extraction**

We used a structured data extraction form to systematically extract essential data from the selected literature. The form included the following data points: reference number, author’s name, year of publication, country, study design, aim, key findings and type of oral health promotion and prevention programme.

**Quality assessment**

We performed quality assessment of our selected studies using established criteria relevant to the respective study designs. We used the Critical Appraisal Skills Program (CASP) tool for quality appraisal, ensuring a rigorous evaluation of study quality (5). CASP is a tool used to evaluate the methodological rigour of each study and identify potential sources of bias. Two authors conducted the quality assessment independently, with any disagreements resolved through discussion and consensus with the third author.

**Data analysis**

We used a method called thematic content analysis to analyse our extracted data. Content analysis is used to assess and examine the occurrence, significance and connections of particular words, themes or ideas related to oral health disease and prevention programs. Thematic content analysis was used by the authors to extract reliable data, which enabled them to develop meaningful interpretations and conclusions about the status of oral health and oral disease prevention and oral health promotion programmes in the EMR.

**Results**

Our analysis of the literature identified a number of prevalent oral health conditions, existing data on oral health promotion and oral disease prevention programmes and future recommendations. The majority of the selected studies were cross-sectional, randomized control trials, quasi-experimental, longitudinal studies and reviews.

Studies we selected for review followed the following geographic distribution: Afghanistan (n=1) (7), Bahrain (n=2) (8,9), Djibouti (n=1) (10), Egypt (n=10) (11,20), the Islamic Republic of Iran (n=4) (21-24), Iraq (n=1) (25), Jordan (n=4) (26-29), Kuwait (n=3) (30-32), Lebanon (n=2) (33-34), Libya (n=4) (35-38), Occupied Palestinian territory (n=1) (39), Pakistan (n=1) (40), Qatar (n=7) (41-47), Saudi Arabia (n=5) (48-52), Sudan (n=4) (53-56), Syria Arab republic (n=3) (57-59), United Arab Emirates (n=6) (60-65) and Yemen (n=2) (66,67) (Figure 1).

Oral health problems identified across the EMR include poor knowledge about oral health care, high rates of dental caries, periodontal disease, tooth loss, dental fluorosis and oral cancer. Our review suggests that due to the prominence of these issues in the EMR, recommendations and implementations of oral disease prevention and health promotion programmes were initiated for students, parents, pregnant women, medical/dental professionals, and the general population.

We identified many recommendations in the literature on the types of programmes that should be implemented in the EMR: (i) oral health education and awareness; (ii) promoting healthy eating; (iii) oral hygiene practices; (iv) preventative dental services; (v) improved dental education; (vi) dental visits/check-ups; (vii) community engagement via social media; (viii) the promotion of water fluoridation. Several studies used mobile phone applications to leverage modern communication technologies effectively in promoting and maintaining oral health, aiming to reach and engage diverse audiences.
We found that the majority of EMR countries have data on oral diseases among children and emphasize the importance of oral health education for children, such as teaching proper oral hygiene and prohibition from eating sugar-laced foods such as candies (1,11,14,19,25,30,31,33,38,42,43,46,51,52,60). In Bahrain, Djibouti and Egypt, prevention and promotion programmes teach oral hygiene practices such as toothbrushing, fluoridation, healthy eating, and regular visits to a dentist (8-20). El-Nasr suggests that most primary school children experience dental problems due to poor eating habits and a lack of knowledge of oral health (14).

In Afghanistan, preventive dental services and community water fluoridation is recommended to address oral health needs (13). Bahrain has demonstrated that social media engagement can improve community oral health awareness (9). Kuwait’s School Oral Health Program and Qatar’s “Asnani Program” are well established school oral health programmes (22,30,45). United Arab Emirates’ mother and child preventive programme operating in maternity health centres has been successful in oral health promotion for expectant mothers and children (60). The 2015 National Oral Healthcare Reform in the Islamic Republic of Iran covering all children up to the age of 14 years nationwide has greatly improved the nation’s overall oral health (21).

Countries like Egypt, Lebanon and Yemen have reported the need for specialized oral health education and prevention interventions for children with special needs such as autism spectrum disorder, congenital heart defects, Downs syndrome and other disabilities (17,20,34,67). Parents, especially mothers, have been recognized as an important target group for oral health education and awareness programmes in higher income countries like Egypt, Qatar, the Kingdom of Saudi Arabia and the United Arab Emirates (11,16,18,47,48,54). Parental practices and their knowledge have substantial influence on a child’s oral health status and oral hygiene practices. In Egypt, we noted that parents are not discerning about what their children consume and do not prohibit them from taking sugary foods that can damage their teeth (19).

We noted that lower income or fragile-conflict zone areas like the State of Palestine, Pakistan and Sudan only recommend health education interventions for pregnant
women (39,40,54). Articles from Djibouti, Egypt, Qatar and Sudan also tend to focus on oral cancer, precancer, tooth loss and gum diseases but not necessarily promotion or prevention programmes. (10,41,44,53,55,56). One study from the Islamic Republic of Iran showed how an oral health literacy programme can be effective in preventing and managing future oral health problems (24).

Discussion

Through our review of the literature, we found that very few peer-reviewed studies are available in the EMR that evaluate the burden of oral health and oral health disorders, including dental caries, periodontal diseases, fluorosis, gingivitis, tooth loss, oral cancer and other related diseases. We identified only a few specific programmes designed to prevent or reduce the prevalence of oral health disorders.

This review shows that majority of research on oral health in the EMR is from Egypt, Qatar and the Kingdom of Saudi Arabia. While there are fewer articles published from other countries, they still contribute valuable information regarding specific health problems and the prevention and promotion programmes that have been implemented or recommended to address oral health issues in the region.

Regarding preventative oral health practices, we found that in the EMR, oral health interventions focus on activities such as daily toothbrushing, dental flossing and mouth rinsing. We noted that active oral disease prevention and oral health promotion programmes in the region have facilitated access to basic oral health services, raised awareness of proper oral hygiene practices and prevented common oral health issues such as dental caries and gum disease (21). Oral health education and training should be offered to all non-dental medical practitioners including pediatricians, nurses, medical and dental students so they can better advise their patients (8,28,32,37,63,65,66).

Our review shows that the majority of people in the EMR may not be aware of the importance of regular brushing and flossing or the potential consequences of poor oral hygiene. To address this challenge, education programmes are recommended for individuals and communities on proper oral hygiene practices. Such programmes can be delivered through various channels, including community health centres, schools, and social media. In addition to education on oral hygiene, prevention programmes can be developed to address common oral health issues. For example, fluoride treatments or water fluoridation can be used to prevent dental caries, while regular dental check-ups can help in identifying and treating gum disease before it progresses to oral cancer or other life-threatening oral health conditions. Community interventions through the use of mobile phone applications and social media to advertise oral health practices are some of the newer interventions we noted in the region (9,10,24,48,55,58).

Overall, oral disease prevention and oral health promotion programmes are crucial to improving oral health outcomes in the EMR. By increasing awareness of proper oral hygiene practices, addressing common oral health issues, and promoting access to basic oral health education, there is a greater chance that EMR Member States can work towards ensuring that everyone in the region has access to oral health promotion and oral disease prevention programmes.

There were some limitations to this review. First, only 2 databases were searched (PubMed and Google Scholar), which may have limited the ability to find additional articles from other databases like CINHAL and Cochrane Library. Second, only articles published between 2010 and 2023 and in English language were chosen. This could have impacted the quality of findings as older sources may have facilitated comparison between past and current oral health programmes in the EMR and enable meaningful conclusions regarding any changes. To address this limitation, we reviewed in-depth the 61 selected studies to provide insights into the current burden of oral disease and initiatives to mitigate or prevent poor oral health in the EMR. Additionally, there may be instances where oral health programmes in certain countries have not been published and thus remain inaccessible.

Given the focus on the EMR in this systematic review, data availability was limited, highlighting the need for further investigation to gather additional evidence on oral disease prevention and oral health promotion programmes in other regions.

Conclusion

Our review underscores the importance of designing and prioritizing region- and context-specific oral disease prevention and oral health promotion programmes in the EMR to effectively address the unique and diverse oral health challenges in the region. Such programmes will play a vital role in promoting proper oral hygiene practices and preventing common oral health problems. Further studies are needed to document oral health programmes in EMR countries to obtain accurate and more comprehensive information about their oral health practices.

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Revue des programmes de promotion de la santé bucco-dentaire dans la Région de la Méditerranée orientale

Résumé

Contexte : Les affections bucco-dentaires, telles que les caries dentaires, les parodontopathies, la perte de dents, la fluorose dentaire, les traumatismes dentaires et le cancer de la bouche, sont prévalentes dans la Région OMS de la Méditerranée orientale. Cependant, aucune revue systématique des interventions de promotion de la santé bucco-dentaire n’a été effectuée dans la Région.

Objectifs : Examiner la littérature existante sur les programmes de promotion de la santé bucco-dentaire dans la Région de la Méditerranée orientale et recommander des améliorations pour l’avenir.


Résultats : La majorité des études étaient transversales, quelques-unes étaient des études contrôlées randomisées, quasi-experimentales, longitudinales ou des analyses. Parmi les problèmes de santé bucco-dentaire recensés figuraient les connaissances insuffisantes dans ce domaine, les caries dentaires, les parodontopathies, la perte de dents, la fluorose dentaire et le cancer de la cavité buccale. Bien que les troubles bucco-dentaires soient courants dans la plupart des pays, très peu de pays ont mis en œuvre des programmes de promotion de la santé bucco-dentaire.

Conclusion : Nous recommandons de prioriser les programmes de promotion de la santé bucco-dentaire dans la Région de la Méditerranée orientale afin de s’attaquer aux différents défis dans ce domaine. Pour être efficaces, ces programmes doivent être spécifiques à la Région et au contexte. D’autres études sur la promotion de la santé bucco-dentaire sont nécessaires dans la Région.

References


