

# Bridging The Gap Between Dentistry and Chronic Disease Prevention

A. Mirwald (Andreas Mirwald), J. Dinkel (Jochen Dinkel), V. Foltin (Viktor Foltin), J. Lochmann (Julien Lochmann), A. Cirusz (Attila Cirusz)

St. Elisabeth University of Health and Social Work in Bratislava,  
Bratislava, Slovakia

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## E-mail address:

info@oralchirurgie-merzig.de

## Reprint address:

Andreas Mirwald  
Namestie 1. maja 1  
P.O. Box 104  
810 00 Bratislava  
Slovakia

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## Reviewers:

Andrea Shahum  
University of North Carolina at Chapel Hill School of Medicine, USA  
Vlastimil Kozon  
Allgemeines Krankenhaus – Medizinischer Universitätscampus, Vienna, AT

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## Abstract:

Over the past few years, oral health has been gaining more attention concerning its connection to overall health and the prevention of chronic diseases. Beijing Health Service Survey research shows that oral health behavior is related to the risk of chronic diseases in middle-aged and older adults living in Beijing, China (Guo et al., 2023). Bad oral hygiene practices are implicated in poor cardiovascular diseases (CVD) as well as endocrine and nutritional metabolic disorders, as stated by the findings. This confirms that oral health behavior is an important modifiable risk factor for chronic illnesses, thereby necessitating integrated intervention programs between oral health and regular disease control.

Guo et al. (2023) denote a particular pertinence of the study focusing on middle-aged and older people, considering Chi-

na's aging population and the escalating prevalence of chronic diseases. By evaluating the daily frequency of toothbrushing as an oral health behavior index, this research has provided valuable information about how simple oral hygiene practices can impact the risk for chronic conditions. These findings add to a growing evidence base that underscores the significance of oral health in preventive healthcare strategies. This paper aimed to explore paths that would link verbal health behavior with chronic diseases and to develop targeted programs that could enhance middle-aged and older adults' practices regarding dental management.

### **The Current State of Oral Health in Europe**

Major oral diseases affected more than half of all Europeans in 2019, which was, as revealed by the WHO report, the highest globally. Specifically, it revealed the highest prevalence rate of caries in permanent teeth, with a population share of 33.6%; Europe also ranked second in tooth loss cases, with 25.2% of adults directly affected (World Health Organization: WHO, 2023). Even though some improvements have been realized, for instance, a decrease in the incidence rates of caries among children aged 1-9 years for deciduous and permanent teeth, the overall situation is still grim (World Health Organization: WHO, 2023). Furthermore, some countries spend very little on oral healthcare per person, while their governments have programs that do not cover dental treatment or provide only a fraction, as shown by this document. Consequently, according to these findings, oral health must be prioritized to bridge these gaps through universal health coverage packages implemented by Member States to improve general public health outcomes.

A report titled 'The State of Oral Health in Europe' highlights several common oral health problems that are prevalent among the European population. Despite a worldwide decrease in dental caries, it is still a significant problem, especially in Eastern Europe and among socio-economically deprived populations across all EU Member States. Periodontitis affects more than 50% of Europeans, with over 10% having severe cases of this disease, mainly those between the ages of 60-65 years (Oral et al., 2024). Oral cancer ranks as the eighth most common type of cancer internationally, and in EU countries, it is ranked twelfth amongst men. These findings point to the improvement of ac-

cessibility to affordable and quality dental care, oral health inequalities being addressed, and the promotion of preventive approaches.

Poor oral health affects general health and well-being significantly. It can be linked to dental problems, such as tooth decay, gum diseases, and mouth infections, which cause much pain and make eating and talking difficult. According to Kotronia et al. (2021), poor oral health has been shown to cause a variety of other chronic illnesses like heart disease, diabetes, and respiratory infections. Poor oral health also affects an individual's self-esteem, quality of life, and socialization (Chaudhary & Ahmad, 2021). Consequently, maintaining good oral hygiene and keeping healthy teeth is vital in achieving good overall fitness. Therefore, oral health is not only crucial for the maintenance of a healthy mouth but also for enhancing general wellness.

### **The Relationship Between Oral Health and Chronic Diseases**

Han et al. (2021) articulate that various chronic diseases, such as cardiovascular disease (CVD) and diabetes, are closely associated with oral health. Examples of poor oral health conditions include such things as periodontal disease that can lead to the emergence and advancement of CVD by increasing inflammation and promoting atherosclerosis. On the same note, people with diabetes tend to have gum diseases more frequently, which intensifies glycemic control impairments and complication risks. This demonstrates the need for holistic healthcare approaches that consider dental hygiene's effects on general well-being.

Periodontitis, an oral mucosa chronic inflammatory disease, is closely tied to numerous other chronic inflammatory diseases, such as

heart disease, diabetes, and autoimmune diseases (Hajishengallis & Chavakis, 2021). It has been found that the link between periodontitis and these co-morbidities is not only a mere association, but there is emerging evidence pointing towards the existence of a causation mechanism. This can lead to systemic low-grade inflammation characterized by raised levels of pro-inflammatory mediators and increased neutrophil counts in the blood, contributing to the beginning and progression of chronic illnesses. Successful local treatment for periodontitis has been demonstrated to reduce systemic markers of inflammation, emphasizing how oral health may influence overall health and supporting the need for managing periodontal conditions among patients with chronic diseases (Taylor et al., 2021).

A survey in Romania revealed a strong association between oral health, especially periodontitis, and systemic diseases. The study showed a positive relationship between how often people have other diseases and the severity of diagnosing periodontitis, which means the more severe the periodontitis is, the higher the chances of comorbid conditions are (Schwarz et al., 2023). Additionally, it was established that smoking is an important characteristic, with non-smokers having lower diagnostic severity of periodontitis than smokers. Accordingly, these findings emphasize how relevant dental health can be to a person's well-being and indicate that managing periodontal disease together with risk factors like smoking would possibly decrease the possibility of getting systemic diseases.

### **Strategies for Integrating Oral Health into Chronic Disease Prevention**

European countries have different prevention and early detection programs for oral health (Chen et al., 2021). Some of these nations have adopted public health strategies that include promoting oral health through national campaigns, community water fluoridation plans, and school-based oral health education initiatives. Other countries concentrate on early detection via regular dental checkups and screening, majorly targeting vulnerable groups like children, older adults, and those with systemic diseases. These schemes aim to scale down the burden of

oral diseases, enhance general well-being concerning oral health, and stop dental disorders from worsening (Chávez et al., 2022). Although more research is required, it also necessitates cooperation to ascertain if such strategies are effective across Europe.

Research on the cooperation between GDPs and DHs in the Netherlands highlights key features affecting collaboration, such as shared goals, leadership style, task allocation, and formalization (Boer et al., 2022). This qualitative study shows how these factors help develop effective collaborations within oral healthcare practices. Additionally, these results indicate that supportive leadership styles and patient or practice-focused goals for collaboration are central determinants of the nature and effectiveness of cooperation. Furthermore, more structured and organized collaboration processes can be seen in larger practices and those affiliated with dental chains, and they are depicted by more formalization. There is a need for clear goals, robust leadership, and structured processes to facilitate the integration of oral health promotion into chronic disease prevention through collaborative efforts between dentists and physicians who would like to learn how to become a dentist or medical doctor, respectively.

### **Technology and Innovation in Dentistry for Chronic Disease Prevention**

A revolution in the early identification and treatment of oral health problems is taking place due to developments in dental technologies, especially robotics, artificial intelligence (AI), and genomics (Nayyar et al., 2020). AI embedded into digital radiographs has become a tool for predicting/detecting caries in radiographs, improving the accuracy and speed of diagnoses. Smart toothbrushes developed using AI coupled with cloud-based software facilitate real-time brushing habit analysis, enabling patients to identify emerging oral health threats before they escalate (Munjal, 2021). This is also helping the orthodontic world achieve previously unimagined precision in manufacturing individualized appliances through 3D printing technology. These technological advancements are changing dental services, making detecting and treating oral health issues faster and more efficient.

The review indicates the possible utilization of mobile health (mHealth) in educating older adults about oral health and promoting their behavior change and knowledge (Chau et al., 2023). Currently, the evidence is limited to only five studies; however, the results indicate that mHealth interventions can improve oral health outcomes among older adults (Chau et al., 2023). Such interventions use mobile phones to disseminate information on oral health and link patients to services they need to overcome barriers like functional impairment or lack of access to professional care (World Health Organization, 2021). Despite these encouraging results, more research is needed to evaluate how effective and acceptable mHealth interventions are for this population.

### **Challenges and Barriers to Integrating Oral Health into Chronic Disease Prevention**

Integrating oral health into chronic disease prevention in Europe is challenged by the socioeconomic disparities in access to oral healthcare. An individual's income level, education, and social status strongly influence their decision to receive dental care and whether or not they can afford it. Many European nations do not fully recognize oral healthcare as part of the public health system, leading to inequalities based on what a person has in their pocket. Furthermore, cultural beliefs and practices around oral health may affect its perceived importance regarding dental care provision and prevention measures (Sigurdardottir et al., 2022). These challenges call for a comprehensive approach, such as policy changes that enhance accessibility to oral healthcare amongst underprivileged communities, educational campaigns that sensitize people about oral health, and initiatives to reduce inequality in accessing medical services between social classes.

Insufficient patient awareness and education about the link between oral health and overall body conditions make integrating oral health into chronic disease prevention difficult. Most patients suffering from major systemic diseases have no idea or knowledge about this association, as less than 50% of people understand this relationship (Akl et al., 2021). Inadequate communication of relevant medical information between healthcare practitioners and patients

and ignorance by healthcare practitioners are the reasons behind this. Time constraints, access to health services, lack of clinical training, cost, and the limited availability of oral health facilities are other barriers that prevent integration efforts (Niesten et al., 2021). Moreover, the lack of knowledge affects physical health and leads to psychological distress and economic problems, resulting in poor quality of life at later stages.

The harmonious inclusion of oral health in the prevention of chronic diseases is hindered by regulatory challenges facing the implementation of integrated care approaches. By creating silos that inhibit collaboration and coordination among oral health providers and other healthcare professionals, regulatory frameworks often separate oral health from general healthcare. Furthermore, regulatory barriers may exist to the scope of practice, reimbursement policies, and licensing requirements, limiting oral health practitioners' full participation within integrated care teams (de Lara & Frazão, 2021). To surmount these regulatory challenges, policy changes must recognize the interconnectivity between systemic and oral health while promoting integration with the overall provision of healthcare services.

### **Conclusion**

In conclusion, this paper has stressed the importance of maintaining oral health to prevent chronic diseases. As per the literature review, it is apparent that most patients are not informed about how their oral health relates to systemic diseases. This ignorance is made worse by the difficulties faced while incorporating oral health into mainstream healthcare services. However, regardless of all these facts, there is still a big gap between oral care and general healthcare provision, affecting the lives of individuals with such ailments.

Moving forward, policymakers, health workers, and society as a whole must recognize the significance of implementing integrated care designs for oral healthcare and chronic disease prevention. Policy changes to support the incorporation of oral healthcare could be a means to end the chasm between dental well-being and mainstream medical care. Such measures include increased awareness among

patients, improved regulatory frameworks, and fostering collaboration between dentists and other medical practitioners. By focusing on oral well-being and employing integrated care strategies, we can achieve better outcomes, improve lives, and reduce the costs associated with chronic illnesses in terms of individuals and health systems.

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