

Primary Care for Oral Health

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The International Dental Federation (IDF) defines oral health as “multi-faceted and included the ability to speak, smile, smell, taste, touch, chew, swallow and convey a range of emotions through facial expressions with confidence and without pain, discomfort, and craniofacial complex diseases”. The IDF definition integrates oral health with general health, demonstrating that it affects overall health and well-being. Therefore, increasing awareness about the different dimensions of oral health and how they change over time empowers people by recognizing that values, perceptions, and expectations influence its outcomes.

primary prevention

adult

oral health

dental caries

1. Introduction

The concept of oral health was extended with the addition of the feeling of well-being after the World Health Organization (WHO) expanded the definition of health by encompassing social well-being. Since then, oral health has been considered to also contribute to general well-being, not just the absence of pathologies. Everyday activities such as eating, talking, smiling, and contributing to society are included in a person's well-being. Therefore, oral health is currently understood to be an integral part of overall health and well-being ^[1].

A paradigm shift has occurred regarding health, disease causation, and healthcare delivery in medicine and dentistry. The medical model has been replaced by the socio-environmental model of health, which assumes health status as the capacity for optimal functioning and social and psychological well-being. Thus, oral health is a comfortable and functional dentition allowing individuals to continue in their desired social role ^[2]. The primary responsibility for maintaining oral health lies with the individual or their caretakers, which must be achieved through effective, evidence-based self-care. Still, public health policy support, education, professional monitoring, and therapeutic interventions are necessary. Self-care becomes more effective when individuals have oral health literacy and thus demand a functional and aesthetically appealing dentition. Dentistry, therefore, has a vital role in promoting strategies and methods of primary prevention of dental caries for improving and maintaining oral health ^[3].

2. Dental Caries

Dental caries is the most prominent oral health problem affecting most adults, including in industrialized countries. The prevalence of dental caries in permanent dentition in Portugal has been decreasing significantly, as reported

by national studies, reaching very satisfactory levels, particularly in individuals who benefit from the activities developed under the National Program for Oral Health Promotion (Programa Nacional de Promoção da Saúde Oral, PNPSO) ^{[4][5]}.

The WHO's global oral health assessment shows that while there has been a significant improvement in many countries, untreated dental caries is still a significant global burden: "The current pattern, within dental caries and periodontal disease, reflects the different risk profiles in different countries (the living conditions, lifestyles, and environmental factors) and, in particular, the result of the implementation of oral health promotion programs" ^{[6][7]}. One significant challenge today is the unmet treatment needs of adult patients, indicating limited access to dental care and insufficient primary prevention efforts. Therefore, the adult population still experiences significant complications due to untreated caries. Thus, more measures must be adopted by the NHS, as well as by health entities and professional organizations, to minimize the prevalence of dental caries in the world, particularly in Portugal ^[8].

Developing preventive interventions at the primary prevention level can lead to potentially sustainable normative support for oral hygiene, locally tailored and targeted approaches, and ongoing positive changes in specific oral health practices. Such interventions can reduce the short- and long-term psychosocial and economic costs associated with disabling oral health problems and help prevent the exacerbation of chronic and disabling diseases ^{[9][10][11]}. Nowadays, there are high-standard treatments for untreated caries ^[12], but this may negatively affect the NHS and patients either from a health or from an economic point of view ^[13].

Currently, primary prevention strategies should consider models of behavioral change and patient empowerment linking oral health to a healthy lifestyle, considering the following parameters: capacity, opportunity, motivation, the feeling of appreciation, behavior, and patient-centered strategies. Moreover, the current health perspective includes a holistic, global, and integrative approach in a predictive, preventive, personalized, and participatory vision. The biggest challenge for community oral health is to promote proactive strategies in adult patients. Therefore, collaboration work and stakeholder networking will be the key to success. This requires the effective use of education strategies ^{[14][15][16][17][18]}.

3. Primary Health Care and Its Promotion

The concept of primary health care was defined at the Alma-Ata conference in 1978. Primary care for oral health is an integral part of primary health care. In 1984, the European WHO Discussion Document ^[19] defined health promotion as follows: health promotion involves the population as a whole, in the context of their daily lives, as opposed to focusing on people at risk of specific diseases; it is directed towards action on the determinants or causes of health; it combines diverse but complementary methods or approaches; it aims at particularly effective and concrete public participation; and health professionals have an important role in sustaining and enabling health promotion ^{[19][20]}.

Health promotion programs are effective if based on a holistic perspective of health, empowering citizens to manage their health, promoting equitable access to information, and leading to the adoption of healthy lifestyles [21]. Thus, several primary prevention methods applicable to oral health can be developed among adults, including behavioral factors, such as regular tooth brushing, dental flossing, a balanced diet, and regular dental checkups. These factors significantly reduce the risk of oral disease [22][23][24]. Currently, there is a paradigm shift in the treatment of dental caries, advocating a preventive approach, resulting in the conservation of dental structure [25][26].

There are two primary clinical preventive strategies for reducing the risk of dental caries: topical fluoride application and fissure sealant application. Topical fluoride application is a more effective method on smooth tooth surfaces, while pit and fissure sealants are used successfully on the occlusal tooth surface [27][28][29][30]. Pit and fissure sealants prevent oral bacteria and carbohydrates, from the diet, from accumulating in the cavities and fissures and developing an acidic environment essential for developing the dental caries process. One advantage of pit and fissure sealant application is related to the fact that this is an easy technique without the need for local anesthesia [23]. Due to their liquid and fluid consistency, sealants flow over the irregular surface of grooves and fissures, filling all the porosities present, sealing the regions that retain bacterial plaque and, as a result, preventing and/or delaying the appearance of occlusal dental caries. On the other hand, pit and fissure sealants are mainly characterized by their fluoride-releasing action [31][32][33][34].

Another approach to prevent caries is the use of xylitol. It has been used since the early 1960s in the diet of diabetic patients and, most recently, as a sweetener in products aimed at improved oral health [35][36]. Xylitol disrupts the energy production processes of mutans streptococci, leading to a futile energy consumption cycle and cell death. Moreover, it reduces plaque formation and bacterial adherence and inhibits enamel demineralization [37]. The first xylitol studies in humans showed the relationship between dental plaque and xylitol and the safety of xylitol for consumption [38]. The first chewing gum developed with the aim of reducing caries and improving oral health was released in Finland in 1975 [23]. Since then there have been various products introduced and sold over the counter and applied professionally worldwide. It has demonstrated to be an effective strategy as a self-applied caries preventive agent [35], and the recommended dose for dental caries prevention is 6–10 g/daily [39].

4. Fluoride Therapy

Fluoride has played an essential role in protecting enamel. Therefore, the relationship between fluoride and demineralization reduction is log-linear [40][41]. Evidence shows that fluoride is more effective than calcium [42] and can be found in various forms and concentrations, such as toothpaste, mouthwashes, gels, and varnishes [43]. Evidence reports that fluoride toothpaste (1000 to 1500 ppm) effectively reduces dental caries rates [44]. A systematic literature review [45] showed that fluoride toothpaste (1000 to 1250 ppm fluoride) was more effective than non-fluoride toothpaste in reducing dental caries rates. Fluoride mouthwash typically has 0.05% sodium fluoride, corresponding to a solution with approximately 230 ppm of fluoride [46]. In turn, fluoride varnishes have 5% sodium fluoride (22,600 ppm) as the active agent and can be used to prevent dental caries [47][48][49][50][51]. Fluoride varnish treatments effectively stop the progression of tooth demineralization, reducing dental caries significantly by

approximately 50% to 70% in dental pits and fissures. Their effectiveness is even greater on interproximal surfaces. The beneficial effect of varnishes on permanent teeth is thus recognized [52][53][54]. Patients at high risk of dental caries, namely patients with xerostomia, and elderly patients at risk of root caries, may benefit from boosters to improve the remineralizing and preventive efficacy of fluoride [55][56].

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