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THE ROLE OF MODERN DENTISTRY IN IMPROVING HUMAN HEALTH AND QUALITY OF LIFE

Scientific supervisor: **Asatullayev Rustamjon Bakhtiyarovich**
Student: **Sayfiddinova Barno**
Student, Faculty of Dentistry Samarkand State Medical University
Samarkand, Uzbekistan

ABSTRACT

Oral health is an essential component of general health and well-being. It affects a person's ability to eat, speak, communicate, and participate confidently in everyday life. Modern dentistry extends beyond the treatment of damaged teeth: it includes prevention, early diagnosis, minimally invasive care, functional rehabilitation, and the promotion of health-related quality of life. Dental caries, periodontal diseases, and tooth loss remain important public health concerns worldwide. This article reviews the significance of oral health, common oral diseases, contemporary diagnostic and treatment technologies, preventive strategies, and the professional responsibilities of dental practitioners.

Keywords: *dentistry, oral health, dental caries, periodontal disease, prevention, digital dentistry, dental materials, quality of life.*

1. INTRODUCTION

Dentistry is a branch of healthcare concerned with the prevention, diagnosis, and treatment of diseases and conditions affecting the teeth, gums, jaws, and other structures of the oral and maxillofacial region. Oral health is closely connected with general well-being. Pain, infection, missing teeth, and difficulties with chewing or speaking can affect nutrition, social interaction, self-confidence, and daily activities.

The World Health Organization has identified oral diseases as a major global health challenge. Its global estimates indicate that oral diseases affect approximately 3.5 billion people. This burden demonstrates the importance of accessible dental services, health education, and preventive programmes. The central aim of contemporary dentistry is not simply to repair damage, but to preserve natural tissues, reduce disease risk, restore function, and support long-term oral health.

2. COMMON ORAL DISEASES AND THEIR CLINICAL SIGNIFICANCE

Dental caries is a biofilm-mediated, diet-modulated disease in which repeated acid production by microorganisms leads to the demineralisation of dental hard tissues. If the process continues without appropriate management, it may progress from enamel into dentine

and eventually involve the dental pulp. Early detection allows clinicians to use preventive and minimally invasive approaches where appropriate.

Periodontal diseases affect the tissues that support the teeth. Gingivitis is an inflammatory condition of the gums commonly associated with dental plaque; it may cause redness, swelling, and bleeding. Periodontitis is a more severe inflammatory disease that can lead to loss of periodontal attachment and supporting alveolar bone. Other conditions encountered in dental practice include pulpitis, periapical disease, dental erosion, malocclusion, oral mucosal disorders, and partial or complete tooth loss.

The clinical consequences of oral diseases extend beyond the mouth. Persistent pain and impaired chewing may influence food choices and nutrition, while visible dental problems can affect communication and psychological well-being. Timely professional assessment is therefore important, especially when symptoms persist or worsen.

3. MODERN DIAGNOSTIC AND TREATMENT TECHNOLOGIES

Technological development has improved the accuracy, efficiency, and comfort of dental care. Digital radiography provides diagnostic images while allowing clinicians to assess dental structures and supporting tissues. Cone-beam computed tomography may be indicated for selected complex cases, particularly when three-dimensional information is required for treatment planning. These examinations should be prescribed according to clinical need and radiation-protection principles.

Intraoral scanners create digital impressions of the teeth and oral structures. Computer-aided design and computer-aided manufacturing (CAD/CAM) systems can be used to design and produce restorations such as crowns, inlays, and onlays. These technologies support precise workflows and may reduce the need for conventional impression procedures in suitable cases.

Modern restorative dentistry uses a range of materials, including resin-based composites, glass ionomer cements, ceramics, and dental alloys. Material selection depends on the clinical situation, the location and size of the restoration, functional demands, aesthetics, and the properties of the material. Dental implants are also widely used in appropriate patients to support fixed or removable prostheses and help restore oral function.

4. PREVENTION AND EVIDENCE-BASED ORAL HYGIENE

Prevention is a fundamental principle of modern dentistry. Effective daily plaque control, appropriate fluoride use, healthy dietary habits, and regular professional assessment can reduce the risk of many oral diseases. Patients should be encouraged to brush twice daily with fluoride toothpaste and to clean between their teeth using dental floss or another suitable interdental aid.

Frequent consumption of foods and drinks containing free sugars increases the risk of dental caries. A balanced diet, limiting sugary snacks and drinks, and choosing water as a regular beverage can support oral health. Depending on a patient's age and individual risk, a dental professional may recommend fluoride varnish, fissure sealants, or other preventive measures.

Regular dental visits are valuable even when there is no pain. Professional examinations can identify early changes, assess individual risk factors, provide tailored advice, and detect conditions that may otherwise remain unnoticed. Prevention is most effective when patients and dental professionals work together.

5. THE ROLE, COMPETENCE, AND ETHICS OF THE DENTIST

A dentist combines scientific knowledge with practical clinical skills. Safe practice requires an understanding of anatomy, physiology, microbiology, pathology, pharmacology, dental materials, and infection prevention. Dentists must also communicate clearly, obtain informed consent, protect patient confidentiality, and explain treatment options in a way that supports shared decision-making.

Infection prevention and control are essential in every dental setting. Appropriate hand hygiene, personal protective equipment, cleaning and disinfection of clinical surfaces, and validated sterilisation of reusable instruments help reduce the risk of cross-infection. Dental professionals must follow current national requirements and institutional protocols, maintain accurate clinical records, and pursue continuing professional development.

6. DISCUSSION

Contemporary dentistry increasingly emphasises prevention, preservation of natural tooth structure, and care based on the best available scientific evidence. Digital tools and improved biomaterials offer new possibilities, but technology alone does not guarantee successful treatment. Accurate diagnosis, appropriate case selection, clinical judgement, patient cooperation, and long-term maintenance remain essential.

A further challenge is unequal access to oral healthcare. Cost, distance, limited health literacy, and shortages of dental professionals may prevent some communities from receiving timely care. School-based education, community prevention programmes, and integration of oral health into wider primary healthcare can help address these barriers.

7. CONCLUSION

Modern dentistry plays a vital role in protecting oral health and improving quality of life. Healthy teeth and gums support comfortable eating, clear speech, social confidence, and general well-being. The prevention and early management of oral diseases, together with responsible use of modern diagnostic tools and dental materials, can preserve natural teeth and reduce the need for complex treatment.

The future of dentistry depends on scientific progress, ethical clinical practice, effective communication, and public awareness. For a future dental professional, the most important responsibility is not merely to treat individual teeth, but to help patients maintain oral health throughout their lives.

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