



UBT Faculty of Dentistry

Strategic Research Plan 2021-2026



Statement of purpose

The intent of this document is to encourage and support both individual and collaborative research as well as increase external funding for research support within the Faculty of Dentistry, UBT College.

Research plan

- Collecting data of research carried during the last five years to define area of interest.
- Reviewing the academy of scientific research and technology for areas of interest in dental health.
- Studying the community needs.
- Defining faculty areas of interest
- Each department set its own research plan that fulfill the faculty plan

Research Vision

To become recognized globally as a center of excellence in the field of dental research and to have all of its graduate programs accredited nationally, regionally, and globally.

Research Mission

The research mission of the Faculty of Dentistry is to enhance the overall oral and dental health of Kosovar citizens through conduction of high standard research projects in the different fields of dentistry and contributory sciences. The faculty is committed to provide the society with ethical and competent researchers enriched with the necessary knowledge, skills, and behavior. Advancement in research and technology will be transferred to the global public domain aiming to an increased presence internationally.

Core Values

- **Integrity** - The quality of being honest and having strong moral principles.
- **Cooperation** - With empathy that is a universal team value promoting cooperation in the workplace.
- **Commitment** - To innovation and excellence.



Dental Faculty Research Plan

Theme 1: Epidemiology

Epidemiologic studies are very important, not only to evaluate the actual burden of the disease but also to elucidate probable susceptibility differences among various populations. The research will provide information on oral health among Kosovo population over time and the findings will inform Government policy maker for better understanding and addressing dental health needs. The research will also enhance communication skills, attitudinal awareness, and working experiences essential for the successful fulfillment of collaboration and consultation responsibilities in oral epidemiologist.

Research Objectives

1.1. Detection of the prevalence and incidence of the most common oral and dental diseases in Kosovo population

- [1] Detect the prevalence and incidence of periodontal and peri-implant diseases at the faculty level (patients attending outpatient and specialty clinics).
- [2] Detect the prevalence and incidence of periodontal and peri-implant diseases in Kosovo population at the national level.
- [3] Study prevalence or incidence of oral manifestations related to environmental factors and personal habits in the Kosovo population.
- [4] Study Incidence or prevalence of autoimmune and immunologically mediated disorders affecting oral cavity in the Kosovo population.
- [5] Detect the prevalence and incidence of dental caries and other common oral and dental diseases in Kosovar children at the faculty and national level.
- [6] Detect the prevalence and incidence of the most common oral pathological conditions in the Kosovar population.
- [7] Assess the incidence of completely and partially edentulous patients and correlate it to their ages, possible local or systemic predisposing factors.
- [8] Evaluate patient needs for the different prostheses and their satisfaction with treatment.
- [9] Study the prevalence of distribution of trauma, diseases of the orofacial region and distribution of tumors of the oro-facial region among Kosovar population.
- [10] Study the incidence of jaw deformities among Kosovar population.
- [11] Study the prevalence of malocclusion and dento-facial orthopedics in different age groups.
- [12] Assess etiological factors underlying different malocclusion and dento-facial deformities.



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- [13] Detect the prevalence and incidence of Temporomandibular joint disorders due to impaired occlusion at the faculty level (patients attending outpatient and specialty clinics).
 - [14] Detect the prevalence and incidence of Temporomandibular joint disorders due to impaired occlusion in Kosovar population at the national level.

1.2. Detection of risk factors for different oral and dental diseases

- [1] Detect risk factors for periodontal and peri-implant diseases.
- [2] Study the relation between different environmental factors, personal habits or systemic condition and changes in oral health status.
- [3] Detect risk factors for dental caries and other common oral and dental diseases in Kosovar children.
- [4] Examine the role of genetic factors and other risk factors e.g., tobacco intake, etc., in oral pathological conditions.
- [5] Study the correlation between the state of partial or complete edentulism and the incidence of temporomandibular joint disorders.
- [6] Detect different risk factors involved in caries incidence and develop new methods for caries risk assessment.
- [7] Elucidate the risk factors involved in different non-carious lesions and develop new methods for its risk assessment.
- [8] Detect risk factors for Temporomandibular joint disorder.

1.3. Early detection and prevention of oral cancer

- [1] Study Incidence or prevalence of potentially malignant and malignant lesions of the oral cavity in the Kosovar population.
- [2] Assess the efficacy and safety of chemo preventive interventions for malignant transformation.
- [3] Apply highly updated technologies on a molecular level that enhance the screening, early detection, and likelihood of oral tumors.
- [4] Correlate the oral tumors with the social and economic demographics to help minimize the prevalence of oral tumors.
- [5] Evaluate the effectiveness of different methods or markers used in the early detection of oral cancer.
- [6] Detect oral cancer early using recent innovations in MRI, CT, CBCT, and nuclear medicine.



Theme 2: Special needs patients

The research will focus on data collection and analysis of oral health status of patients with special needs. This will provide innovative methods for exploring changes in their oral and dental health aiming to prevent disease development and progress.

Research Objectives

2.1. Detection of the prevalence of oral and dental diseases in patients (children and adults) with special needs and addressing their treatment needs

- [1] Study prevalence or incidence of oral manifestations related to systemic conditions in the special needs Kosovar population.
- [2] Study prevalence or incidence of drug induced oral manifestations in the special needs Kosovar population.
- [3] Detect the prevalence of oral and dental diseases in children with special needs.
- [4] Examine radiographically patients with special needs to collect and analyze radiographic data and findings to detect the prevalence of oral and dental diseases in these patients (children and adults) in collaboration with departments addressing their treatment needs.
- [5] Detect caries prevalence and incidence of non-carious dental lesions in adult patients with special needs and address their treatment needs.
- [6] Detect incidence of carious and non-carious dental lesions in geriatric patients and address their treatment needs.

2.2. Establishment of innovative preventive measures of oral and dental diseases in patients with special needs as well as treatment

- [1] Assess the efficacy and safety of preventive interventions for oral complications of cancer treatment with special needs patients.
- [2] Prevent and treat oral and dental diseases in children with special needs.
- [3] Establish innovative preventive measures that are suitable for adult patients with special needs.
- [4] Elucidate different biological and surgical approaches used to manage dental lesions in adult patients with special needs.
- [5] Establish innovative preventive measures for carious and non-carious lesions in geriatric patients.
- [6] Evaluate and compare different approaches in managing carious and non-carious lesions in geriatric patients.



Theme 3: Evaluation and innovation in dental instruments techniques, medicine, and materials

Basic information on the physical, antimicrobial as well as the biomechanical properties of dental and craniofacial biomaterials are important in the development of successful clinically acceptable dental materials. Various treatment modalities and techniques are recently introduced for management of oral, dental, and maxillofacial disorders and diseases. The evaluation of the new approaches and the innovation in the field would provide better patient satisfaction and enhancement of dental practice.

Research Objectives

3.1. Innovation and evaluation of recent techniques and designs in dental practice

- [1] Evaluate new techniques in management of gingival deformities.
- [2] Evaluate new techniques in management of periodontal defects (horizontal, intra-osseous, furcation defects).
- [3] Evaluate new techniques in management of dental caries and other common oral and dental diseases in Kosovar children.
- [4] Evaluate tissue response to recent techniques in dental practice.
- [5] Innovate and evaluate new techniques and designs for occlusal appliance therapy.
- [6] Innovate and evaluate new designs and treatment modalities in removable and maxillofacial prostheses.
- [7] Innovate and evaluate new appliances for sleep disordered breathing.
- [8] Introduce new treatment concepts and application in extra and intra oral maxillofacial prosthodontics.
- [9] Introduce 3 D printing in prosthodontics field.
- [10] Innovate different modalities for management of TMJ diseases.
- [11] Assess the response of different aspects of neuromuscular and skeletal system in relation to orthognathic and TMJ surgery
- [12] Evaluate the advanced techniques in facial implants and to evaluate its use in facial reconstruction and rehabilitation.
- [13] Investigate new modalities for treatment of tumors and relevant reconstruction.
- [14] Investigate new and improved advanced techniques in orthognathic surgery.
- [15] Clarify the effect of new modalities of cleft lip and palate surgery on adjacent and distant structures.
- [16] Investigate the efficacy of new techniques, drugs, and computer controlled local anesthesia in pain control.
- [17] Evaluate the computer guided soft and hard tissue in oral and maxillofacial surgical reconstruction and applications of navigation system.



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- [18] Evaluate and modify current methods used in management of infection in orofacial head and neck region.
 - [19] Evaluate and modify updates in maxillary sinus problems and approaches.
 - [20] Evaluate different innovative bone augmentation techniques in reconstruction of jawbone.
 - [21] Investigate the response of oro-facial and neck soft tissue to different interventions of maxillofacial trauma in children.
 - [22] Innovate and evaluate new simplified techniques in management of trauma in children.
 - [23] Evaluate and innovate advanced technology and technique for management of post-traumatic residual deformities.
 - [24] Evaluate different TMD treatment modalities.
 - [25] Set evidence-based treatment protocols for different malocclusion.
 - [26] Evaluate the use of mini screws and mini plates in different treatment applications.
 - [27] Assess different aspects of mini screws and miniplates stability and causes of failure.
 - [28] Assess radiographically the reliability and efficacy of techniques in dental practice as surgical techniques, tissue engineering techniques, etc.
 - [29] Evaluate advanced designs in tooth preparations.
 - [30] Introduce innovative designs in tooth preparation in accordance with recent modifications in restorative materials.
 - [31] Evaluate the effect of recent caries removal concepts and techniques on recurrent caries, pulp, and periodontal tissue.
 - [32] Evaluate mechanical behavior of recent restorative materials and techniques under different oral environmental conditions.
 - [33] Evaluate different esthetic treatment modalities used for correction of shape, size, and color of different esthetic disorders.
 - [34] Evaluate and assess long-term durability and prognosis of different restorative materials and clinical treatment modalities.
 - [35] Investigate shaping ability with new instruments and/or biomechanical preparation techniques under various conditions e.g., different degree of curvatures or in oval canals.
 - [36] Investigate smear layer removal and/or debridement and/or apical extrusion of debris after different/new irrigation techniques or instrumentation techniques or retreatment techniques.
 - [37] Investigate the dissolution of different obturating materials and the efficiency of their removal on using different procedures.
 - [38] Investigate apical extrusion of debris after different/new irrigants/irrigation techniques or intracanal medication or instrumentation techniques or obturation or retreatment techniques.
 - [39] Apply novel construction techniques for crowns and fixed partial dentures.
 - [40] Evaluate new designs from physical, mechanical, and biological aspects.
 - [41] Apply optimal management of mutilated vital teeth reconstruction.



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- [42] Maintain the integrity of mutilated non-vital teeth through the employment of various reinforcing materials and techniques.
 - [43] Formulate esthetic treatment modalities using latest digital smile designing technology
 - [44] Assess new protocols for different restorations.
 - [45] Evaluate advances in restorative esthetic field.
 - [46] Apply digital technology in various aspects of fixed prosthodontics.

3.2. Innovation and evaluation of physical properties of new materials, instruments and devices used in dental armamentarium

- [1] Innovate and evaluate new materials for occlusal appliance therapy.
- [2] Evaluate and assess recent dental instruments and tools used in Conservative dentistry.
- [3] Establish innovative instrumentation for tooth preparation and restoration.
- [4] Investigate physicochemical properties of different/new endodontic obturation materials, sealers, and root repair materials.
- [5] Investigate surface topographic changes of different endodontic enlarging instruments on exposure to various conditions e.g., autoclave sterilization, irrigants, canal preparation.
- [6] Evaluate new materials from physical aspects.

3.3. Experimental and computational analysis of biomechanical stress as obtained for example by finite element (FE) modeling

- [1] Investigate different/ new endodontic instruments in terms of biomechanical behavior (e.g., fracture resistance; flexural cyclic fatigue, torsional strength) under different conditions of canal curvatures, irrigation, and sterilization and/or cutting efficiency conditions.
- [2] Investigate different/ new endodontic sealers or obturation materials or repair materials in terms of bond strength to dentin and/or its degradation under different conditions.
- [3] Investigate root resistance to fracture using new/different endodontic materials or reinforcing protocols.
- [4] Investigate changes in root dentin, such as development of microcracks, using different chemicals, materials, or instrumentation techniques.
- [5] Evaluate new materials from mechanical aspects.



3.4. Assessing the efficacy of new materials and medicines in vitro and in clinical trials

- [1] Evaluate and innovate medicines and technologies for treatment of oral diseases.
- [2] Assess the efficacy and safety of herbal medicine or alternative technologies to treat oral mucosal lesions
- [3] Assess the efficacy and safety of interventions managing oral complications of cancer treatment.
- [4] Utilize natural alternatives and/or natural additives to commercially available dental materials.
- [5] Update the knowledge about new materials, equipment, and technologies in treatment of most dental and oral diseases.
- [6] Evaluate the esthetic stability of recent anterior esthetic restorative materials.
- [7] Evaluate the effect of new restorative materials on recurrent caries, pulp, and periodontal tissue.
- [8] Investigate pain and/or periapical healing with different/new intracanal medication, or therapeutics, irrigation materials or obturation or retreatment materials.
- [9] Investigate smear layer removal and/or debridement and/or apical extrusion of debris after different/new irrigants or intracanal medication or retreatment materials (solvents).
- [10] Assess bonding materials for different restorations.

Theme 4: Oral health in the perspective of systemic health

Systemic health is often closely linked to the state of the oral cavity; many systemic diseases and conditions have oral manifestations. Likewise, oral microbiological infections may also affect one's general health status. Better understanding of this correlation will help both dental and medical professionals to determine the best approach to patient care.

Research Objectives

4.1. Investigation of the impact of oral and dental diseases on systemic health to integrate oral health promotion and care with other health sectors using the common risk factor approach.

- [1] Investigate the impact of periodontal diseases on cardiovascular diseases, rheumatoid arthritis, pulmonary diseases, and renal diseases.
- [2] Investigate the impact of systemic diseases and conditions on periodontitis including obesity, stress, and nutritional deficiencies.
- [3] Investigate the impact of dental caries and other common oral and dental diseases in children and children with special health care needs.



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- [4] Search for evidence of association between oral health and general health status using radiographic assessment.
 - [5] Investigate the influence of dental hard tissue lesions on health promotion of patients with systemic diseases.
 - [6] Evaluate the influence of systemic diseases and their treatment side effects on dental caries incidence and prevention.

4.2. Evaluation of the impact of treatment of diseases of oral and craniofacial origin on minimizing the development of physical and psychosocial diseases

- [1] Evaluate the impact of treatment of periodontal diseases on individuals' quality of life.
- [2] Evaluate the impact of full oral rehabilitation on children's quality of life.
- [3] Study the side effects of different treatment modalities and medications adopted during treatment of different oral diseases and neoplasms.
- [4] Investigate the influence of treatment modalities of dental hard tissue lesions on health promotion of patients with systemic diseases.

Theme 5: Dental implants

It is imperative that the routine clinical use of any implant system should be based entirely on an evaluation of the outcome of that specific system in prescribed scrutiny of long-term follow-up clinical investigations. The immediate and delayed loadings as well as different bone augmentation techniques were studied in the literature. Future focus is directed to the improvement of implant therapy in a patient-oriented approach minimizing time and pain while maximizing esthetics and long-term outcome.

Research Objectives

5.1. Evaluation of different innovative techniques of guided implant surgery

- [1] Evaluate the application and accuracy of computer aided implant surgical guide (3 D printing versus milled).
- [2] Evaluate radiographically different innovative techniques of guided implant surgery.
- [3] Apply and assess computer-guided planning for implant placement in conjunction with abutment and supra-structure designs.
- [4] Assess biomechanics of different implant supra-structures.



5.2. Investigation and innovation in prosthodontics aspect of dental implants

- [1] Innovate and evaluate new strategies for implant placement and restoration.
- [2] Evaluate biomechanical technical risks in implant prosthodontics.
- [3] Evaluate new occlusal consideration in implant prosthodontics.
- [4] Evaluate post-prosthetic implant imaging to reveal any alveolar bone changes.
- [5] Evaluate different materials and designs for implant supra-structures.

5.3. Investigation of new surgical techniques and implant design to achieve better bone and soft tissue quality and patient satisfaction at implant site

- [1] Investigate new techniques for implant site development and management of alveolar defects.
- [2] Investigate new surgical techniques to improve esthetics and patient satisfaction at implant sites.
- [3] Evaluate novel implant materials and surface modification techniques for dental implant in vivo.
- [4] Evaluate, characterize, and optimize novel implant materials and surface modification techniques for dental implant in vitro.
- [5] Assess the tissue reaction in response to the implant
- [6] Evaluate tissue response to newly developed implant surgical techniques and materials.
- [7] Evaluate radiographic imaging planning in varying computer-guided and aided surgeries.
- [8] Investigate new techniques for implant site development and management of alveolar defects.
- [9] Investigate new surgical and prosthodontic techniques to improve white and pink esthetics which leads to patient satisfaction.
- [10] Evaluate different materials and designs for implants.

Theme 6: Diagnostic research

This research area aims at developing innovative ways of detecting and diagnosing dental diseases and conditions such as caries, periodontal diseases, pulp, and apical diseases with emphasis on the assessment of the sensitivity and specificity of the evolved diagnostic tools and techniques.



Research Objectives

6.1. Assessment of new diagnostic techniques in dentistry

- [1] Assess new diagnostic techniques in pediatric dentistry.
- [2] Evaluate the accuracy of new techniques applied in diagnosis of different pathological conditions.
- [3] Evaluate and compare 2D, 3D, and 4D imaging techniques in orthodontic diagnosis, treatment planning and prediction of treatment outcomes.
- [4] Use stereo-photogrammetry soft tissue analysis for orthodontic patients with different skeletal and dental malocclusion, facial asymmetry and comparing pre and post treatment changes.
- [5] Assess the role of new diagnostic imaging techniques in diagnosis and follow-up of oral and maxillofacial diseases and abnormalities
- [6] Assess the performance of recent diagnostic tools for early detection of dental caries.
- [7] Evaluate the performance of different diagnostic tools and techniques for detection of recurrent caries.
- [8] Assess recent diagnostic tools and techniques for caries examination of deep carious dentin during cavity preparation.

6.2. Development of innovative diagnostic techniques in dentistry

- [1] Evaluate and develop chair side tests for detection of biomarkers associated with the pathogenesis of periodontal and peri-implant diseases.
- [2] Evaluate and develop chair side tests for assessment of microbiologic and immunologic effects of treatment of periodontal diseases.
- [3] Develop new diagnostic techniques in pediatric dentistry.
- [4] Develop innovative diagnostic imaging techniques in diagnosis and follow-up of oral and maxillofacial diseases and abnormalities.
- [5] Develop innovative diagnostic tools and techniques for early detection of dental caries.
- [6] Develop innovative diagnostic tools and techniques for diagnosis of last layer of carious dentin during cavity preparation.
- [7] Apply diagnostic and analytic tools of occlusion and load distribution of natural dentition and artificial fixed restorations.
- [8] Assess of the therapeutic role of fixed prosthodontics in management of occlusion problems.