

TO THE MEMBERS OF THE ACADEMIC JURY,

APPOINTED BY ORDER OF THE RECTOR
OF MU – VARNA No. R 109-208/ June 3, 2026
BASED ON MINUTES No. 1 / June 9, 2026,
OF THE FACULTY COUNCIL OF THE
FACULTY OF DENTAL MEDICINE—VARNA,
REGARDING THE PROCEDURE FOR
AWARDING THE ACADEMIC AND SCIENTIFIC
DEGREE OF “DOCTOR”

OPINION

BY

ASSOC. PROF. DR. IVETA PLAMENOVA KATREVA, DMD, PhD

“PROF. DR. P. STOYANOV” MEDICAL UNIVERSITY—VARNA, FACULTY OF DENTAL
MEDICINE,

DEPARTMENT OF “DENTAL MATERIALS SCIENCE AND PROSTHETIC DENTAL
MEDICINE”

ON A DISSERTATION SUBMITTED FOR THE AWARD OF THE EDUCATIONAL AND
SCIENTIFIC DEGREE OF “DOCTOR”

Doctoral Programme: Prosthetic Dental Medicine
Professional Field: 7.2. Dental Medicine
Broad Field of Higher Education: 7. Health Care and Sports

Author:

Dr. Yordanka Donkova Shekerova

Full-time doctoral student at

Department of Dental Materials Science and Prosthodontics, Faculty of Dental Medicine,
Medical University of Varna

Topic:

*“ Rehabilitation of completely edentulous patients with complete dentures fabricated through a
digital workflow – possibilities, advantages and limitations”*

Supervisor:

Assoc. Prof. Desislava Atanasova Konstantinova, D.M.

GENERAL ANALYSIS OF THE DISSERTATION

The dissertation by Dr. Yordanka Donkova Shekeroval, a full-time doctoral student in the Department of Dental Materials Science and Prosthetic Dentistry, consists of 232 standard pages and is illustrated with 70 tables, 119 figures, and 5 appendices. The bibliography includes 337 references, of which 13 are in Cyrillic and 324 are in Latin script.

The structure of the dissertation complies with the requirements of the Regulations on the Development of Academic Staff at Medical University – Varna and includes all the essential elements of the structure generally accepted in Bulgaria for the presentation of a dissertation.

Relevance of the Topic

The dissertation addresses one of the most challenging pathological conditions in prosthetic dentistry—complete edentulism. This clinical condition has remained a significant therapeutic challenge throughout history and continues to be of substantial clinical relevance today. Its complex impact on fundamental oral functions, facial aesthetics, social integration, overall quality of life, and psychosocial well-being underscores the need for contemporary prosthetic dentistry to continuously develop, implement, and refine innovative technological approaches for the rehabilitation of completely edentulous patients.

The present study explores the application of contemporary digital technologies in the fabrication of complete removable dentures, which, despite the rapid progress in implant dentistry, remain a widely accepted therapeutic option for the prosthetic rehabilitation of patients with complete edentulism.

Despite the significant advances in digital prosthodontics, several challenges remain regarding the accurate digital reproduction of functional denture borders, dynamic soft tissues, and the individual anatomical characteristics of edentulous jaws. Consequently, the present research is focused on the analysis and optimization of digital workflows, as well as on the evaluation of their clinical applicability, accuracy, and overall effectiveness.

The introduction clearly and concisely identifies the key challenges associated with the contemporary digital rehabilitation of completely edentulous patients and highlights potential strategies for optimizing the design and functional performance of complete dentures.

The literature review comprehensively addresses all major aspects of the research topic, presenting the available evidence in a logical, coherent, and well-structured manner.

The literature review incorporates scientific evidence from numerous authors and provides a comprehensive analysis of the anatomical and morphological characteristics of edentulous jaws, two- and three-dimensional diagnostic imaging modalities, impression materials, conventional and

digital impression techniques, as well as contemporary digital workflows for the fabrication of complete dentures. Furthermore, the dissertation examines additive and subtractive CAD/CAM manufacturing technologies, together with the potential applications of digital design, three-dimensional printing, and milling in the prosthetic rehabilitation of completely edentulous patients..

The aim and research objectives are entirely consistent with the topic and scope of the dissertation. The aim logically follows from the critical analysis of the literature. The research objectives are clearly and precisely defined and are fully aligned with the overall aim of the study.

Materials and Methods.

Contemporary diagnostic imaging, clinical, microbiological, and statistical methods were appropriately selected for the clinical, morphometric, and experimental investigation of the enrolled edentulous patients. The methodology is objective, fully aligned with the successful implementation of the research objectives, and ensures the reliability of the obtained results. The materials and methods are systematically presented in a separate chapter and clearly organized according to the individual research objectives.

Within the framework of the **first research objective**, a morphometric analysis of cone-beam computed tomography (CBCT) scans was performed. The sagittal and buccolingual dimensions of the maxilla and mandible were measured using predefined reference lines. The obtained data were analyzed to identify morphological relationships and to establish standardized reference parameters for the digital planning of complete dentures.

Within the framework of the **second research objective**, a clinical evaluation was performed on 60 complete dentures fabricated using a digital workflow based on additive manufacturing technologies. The assessment included retention, stability, peripheral adaptation, patient comfort, phonetics, and aesthetics.

The **third research objective** involved the development and validation of an experimental model of a custom impression tray, designated “OccluTray”, intended for simultaneous functional impression making and maxillomandibular relationship recording.

As part of **Research Objective 3.1**, an industrial design patent was successfully registered.

Within **Research Objective 3.2**, a microbiological investigation was conducted on three-dimensionally printed PLA and ABS impression trays by evaluating microbial contamination following a standardized disinfection protocol.

The **fourth research objective** focused on the analysis of the time efficiency of various functional impression techniques and impression materials.

Within the framework of the **fifth research objective**, an algorithm was developed to optimize and reduce the number of clinical procedures involved in the partial digital workflow.

Statistical analysis of the obtained data was performed using the specialized statistical software package SPSS, version 20.0. The analyses included descriptive statistics, comparative analysis, the independent-samples *t*-test, the Mann–Whitney *U* test, the Kruskal–Wallis test, χ^2 analysis, and Spearman’s rank correlation analysis. Statistical significance was established at $p < 0.05$.

The results obtained for all research objectives are reliable, appropriately illustrated with figures, and thoroughly analyzed.

The discussion of the results is conducted appropriately and demonstrates a critical interpretation of the findings.

The conclusion and the final conclusions are logically formulated, with particular emphasis placed on the scientific and practical contributions of the dissertation.

The contributions are classified as scientific-applied and applied. The author identifies seven original scientific-applied contributions and four confirmatory scientific-applied contributions. In addition, five applied contributions are presented.

The dissertation abstract comprises 97 pages and is illustrated with numerous photographs, figures, and tables. It provides a concise and comprehensive presentation of the principal structural components of the dissertation.

Conclusion

The dissertation of Dr. Yordanka Donkova Shekeroва, entitled *“Rehabilitation of Completely Edentulous Patients with Complete Dentures Fabricated Using a Digital Workflow – Opportunities, Advantages, and Limitations,”* represents a timely and scientifically valuable contribution to the field of prosthetic dentistry, offering a number of original scientific-applied contributions. The issues addressed within the scope of the dissertation are examined comprehensively and critically, and the findings are presented in a clear, systematic, and well-substantiated manner.

The author demonstrates the knowledge, competence, and ability required to conduct independent scientific research.

I give my overall positive evaluation of the dissertation and will vote unequivocally in favour of awarding Dr. Yordanka Donkova Shekeroва the Educational and Scientific Degree of „Doctor“.

1 August 2026

Varna

Prepared by:

Assoc. Prof. Iveta Katreva, DMD, PhD

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