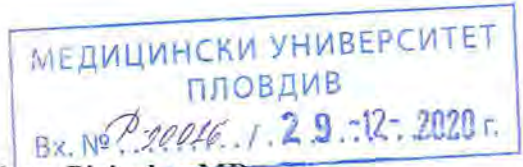


REVIEW



by Prof. Dr. Snezhanka Zaprinova Topalova-Pirinska, MD
Department of Conservative Dentistry, Faculty of Dental Medicine,
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of PhD thesis for awarding the educational and scientific degree "Doctor"
Field of higher education 7. Medicine and sports
Professional field 7.2 Dentistry
Doctoral program Therapeutic Dental Medicine

Author: Dr. Aleksandra Georgieva Pecheva-Stoeva

Form of doctoral studies: self-study base

Department: Operative Dentistry and Endodontics, Faculty of dental medicine, Medical University – Plovdiv

Theme: Application of zirconium CAD/CAM veneers in vital front teeth (questionnaire, laboratory and clinical trials)

Scientific supervisor: Prof. Dr. Snezhana Tsanova, MD

Presentation of the procedure and the doctoral student

Pursuant to Article 32 of the Regulations for application of the ZRACRB, order from the Rector of Medical University of Plovdiv № P-2155/04.12.2020 and according to protocol №1/10.12.2020 from the meeting of the Scientific Jury I review the completed dissertation thesis of Dr. Aleksandra Pecheva-Stoeva.

The documents submitted under the procedure comply with the requirements of Article 115 (1) of the Procedure for Acquisition of Educational and scientific degree "Doctor" in MU - Plovdiv, Regulations of MU - Plovdiv from 06.11.2014.

Dr. Alexandra Pecheva-Stoeva was born on February 21, 1990 in the city of Plovdiv, where she completed her secondary education at the Language High School "Plovdiv" in 2009. She received her master's degree in Dentistry at the FDM, MU - Plovdiv in 2015. From the same year she started a master's degree in "Public Health and Health Management" at FPH, MU - Plovdiv and graduated in 2017. Since 2016 she is an assistant professor in the Department of "Operative Dentistry and Endodontics" at FDM, MU – Plovdiv. The same year she started a specialization program in "Operative Dentistry and Endodontics" and a doctoral program on self-study base at the same department. She successfully completed her specialization in 2019.

As an assistant professor, she teaches students in the discipline "Operative Dentistry and Endodontics". She is also leading a workshop with 4th and 5th year students.

In her CV she announces participation in 2 textbooks, 9 scientific articles and 9 scientific events, as well as she lead a project with university financing for doctoral students and young scientists.

As languages of communication she noted English and Bulgarian.

Structure of dissertation thesis

The structure of the completed scientific work corresponds to the requirements of ZRASRB and the accepted norms for dissertation in FDM, MU - Plovdiv.

The total volume is 180 pages and includes the following main parts: abbreviations - 1 page, introduction - 1 page, literature review - 40 pages, purpose and tasks - 1 page, materials and methods - 30 pages, results and - 47 pages, recommendations to DDM - 6 pages,

conclusions - 1 page, main contributions - 2 pages, used literature - 17 pages, appendices - 10 pages and publications - 1 page.

The bibliography on the topic covers 197 publications, 3 of which are in Cyrillic and 64 from the last ten years.

Relevance of the topic and expediency of the goals and objectives set

Contemporary dental practice places high aesthetic demands on performers. There has been talk of "aesthetic dentistry" long time ago, so existing dental materials and technologies are constantly being improved in search of better and safer ones, both in medico-biological, aesthetic and practical aspects. Part of scientific researches, including in Bulgaria, are focused on experimental, laboratory and clinical research of new aesthetic filling materials for direct or indirect application. It is understandable that the PhD student and her scientific supervisor decided to use CAD /CAM technology to make indirect veneers from a new type of ceramics with expected improved aesthetic qualities, due to preliminary data on its composition, color and translucency which are suitable for the aesthetic rehabilitation of frontal areas of the dentition.

The aim of the PhD student is to study the advantages and disadvantages of CAD/CAM zirconium veneers. Its main tasks are: 1) to study the attitude and awareness of DDM regarding aesthetic restorations with veneers and the application of CAD/CAM technologies; 2) to evaluate the influence of the optical magnification on the precision of the dental preparation under simulated clinical conditions; 3) to evaluate the marginal adaptation of veneers made by two different technologies - CAD/CAM zirconium veneers and press-ceramic veneers; 4) to evaluate the influence of hydrothermal aging on the translucency of zirconium veneers; 5) to make a clinical evaluation of the zirconium veneers and practical recommendations for DDM.

The chosen topic is topical, dissertable and clearly formulated. The title, goal and tasks are precisely set and correspond to the implementation.

Knowledge of the problem

The literature review presents a summary of collected scientific literature in accordance with the chosen topic for the dissertation. The initial part of the review informs about the ceramic materials for veneers, suitable for restoration in the frontal area of the dentition, enough to justify the choice of materials and methods for their processing and to highlight the need to study the applicability of a certain type of zirconium ceramics. In addition, the clinical preparation of the teeth (preparation, preparation design, the benefits of magnifying tools), the adaptation of the veneer to the tooth surface and the aging of zirconium ceramics are considered.

The thematically refined review, which is as clean as possible from repetitions and unnecessary details, shows that the doctoral student knows the state of the problem and evaluates creatively the known scientific material. The review is informative enough and ends with the specification of five unsolved problems in the manufacture of CAD/CAM ceramic veneers, which provide a basis for defining five research tasks. Research methodology The "Materials and methods" section is described in the order of the tasks.

Research methodology

The "Materials and methods" section is described in the order of the tasks. For their implementation, various research materials and methods have been selected: sociological - DDM survey (questionnaire in Annex №1); preparation of artificial or natural teeth for veneers; laboratory methods (scanning, digital designs modeling, digital milling of veneers); CEM; spectrophotometry; contemporary clinical and digital methods for working with

CAD/CAM (patient map in Annex №2). Modern statistical methods have been used at a significance level of $p < 0.05$ (descriptive analysis, graphical, non-parametric, parametric analysis, etc.). The statistical processing is done with IBM SPSS Statistics v.22 and 24.

The research methods are suitable for achieving the set goal and for performing the tasks.

Characteristics and evaluation of the dissertation

The obtained results followed by the discussions are presented in the order of the planned tasks skillfully, consistently and without redundancies. The discussions are a truthful analysis of the statistically processed data and also an attempt to compare own results with already published studies. The evidence is presented in 22 tables, 62 figures and 2 appendices.

Each task ends with conclusions that are actually scientifically proven in the researches conducted by the PhD student. They are based on the results of statistical processing and synthesize the final results of Dr. Pecheva-Stoeva. From Task 1 are derived four conclusions; from Task 2 - four, from Task 3 - three, from Tasks 4 and 5 - three conclusions each. Five main conclusions are also reported.

Dr. Pecheva's recommendations for DDM are formulated as a result of her laboratory and clinical studies in 11 points. I especially like these specific recommendations for the clinical protocol, which should be taken as a guide for the production of zirconium veneers via CAD/CAM technology, as they provide guidelines not only for the sequence of different manipulations, but also to prevent possible procedural errors and clinical failure.

Contributions and significance of development for science and practice

I accept fully the contributions from the dissertation of Dr. Pecheva-Stoeva (ten in total), five of which are original and five of which are confirmatory.

The following contributions are indicated as original: the survey among DDM on the application of indirect veneers and the use of CAD/CAM technology; the application of digital methods for objective assessment of the depth of preparation of dental surfaces for veneers without and with magnifying means (loups or microscope); the comparative study of the marginal adaptation of CAD/CAM zirconium and press-ceramic veneers; the applied artificial aging of zirconium ceramics by hydrothermal aging to determine changes in its transparency and color; creation, approbation and recommendations of a clinical protocol for production and cementation of CAD/CAM zirconium veneers.

This scientific work provides theoretical and applied results and contributions that have a direct importance for diversification of opportunities and improvement of the aesthetics of indirect restorations of vital front teeth, use of science-based protocol for working with CAD/CAM zirconium veneers by DDM, as well as successful training of graduates, trainees and students.

Assessment of the PhD student's publications and personal contribution

The presented list of publications in connection with the PhD thesis of Dr. Pecheva-Stoeva includes three scientific publications for the period 2018-2019, of which one original article in an electronic international edition, one review in a publication of the Union of Scientists in Bulgaria - Plovdiv and one scientific article in a peer-reviewed Bulgarian edition. Three scientific papers are also included, two of which presented during the same period at international congresses abroad and one at an international assembly in the country. Considering the intensive educational and career development of Dr. Pecheva-Stoeva during the period 2016-2019, when she graduated with two master's degrees, specialized and worked on her doctorate, I consider her publication activity as very good. In addition, she participated

in departmental project funding from MU - Plovdiv, related to the development of the dissertation.

I appreciate the ambition shown in the choice of scientific issues, diligence and persistence in mastering certain research methods, creative perseverance in sorting and processing the collected scientific data, analytical discussion, formulation of conclusions and contributions - all personal merits of the PhD student in the implementation of the overall activity.

Summary of a thesis

The content of the PhD thesis is reduced to a summary of 49 pages. As usual, the literature review and bibliography are not presented. Before formulating the goal, however, five unsolved problems are indicated, which become research tasks of the PhD student. The evidence is set out in 22 tables and 50 figures. The summary ends with the same list of three full-text articles and three scientific papers in connection with the dissertation.

The abstract realistically and fully presents the main and most important part of the dissertation without changing its appearance.

Critical remarks

My critical remarks are very simple, due to the fact that the developed dissertation was submitted to me for review before being admitted to public defense, and mostly because it has been considered, implemented and presented very well.

In my opinion, there is no conclusion about the marginal gap between the press-ceramic veneers and the prepared tooth surfaces, similar to conclusion 2 after Task 3. In addition, the common conclusions are measured but limited in number. In my opinion, the ratio of five main conclusions from this scientific development and ten contributions seems inconsistent. I do not dispute the wording of five contributions of an original nature. However, in the way they are formulated, the second and third affirmative contributions seem more like results and needed a slight stylistic change.

Recommendations for future use of PhD thesis' contributions and results

Since the dissertation is innovative, I recommend Dr. Pecheva-Stoeva to promote her recommendations for the protocol of work in the planning process and manufacture of CAD/CAM zirconium veneers among specialized DDM and general practitioners through lectures and appropriate print issue.

CONCLUSION

Dr. Aleksandra Pecheva-Stoeva presents her dissertation with thematic relevance, valid evidence and truthful results, leading to sound conclusions about zirconium veneers made by CAD / CAM technology. The contributions are indisputable and scientifically applied, because they are based on scientific facts and conclusions that are useful for clinical dental practice, for the training of students, specialists and dentists in order to optimize minimally invasive and aesthetic treatment with indirect zirconium CAD/CAM veneers.

In conclusion, I positively evaluate the presented PhD thesis "Application of zirconium CAD/CAM veneers in vital frontal teeth", which contains scientific and applied results with original contribution to science and covers the requirements and criteria of ZRASRB, Rules for application of ZRASRB and the relevant Rules of MU - Plovdiv.

I propose to the members of the Scientific Jury to award the educational and scientific degree "Doctor" to Dr. Aleksandra Georgieva Pecheva-Stoeva in a doctoral program in Therapeutic Dental Medicine.

22. 12.2020

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