

Opinion

From: Assoc. Prof. Dr. Janet Kirilova Nikolova, PhD
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member of the scientific jury according to order № P 2155 / 04.12.2020 of the Rector of Medical University Plovdiv

Subject: PhD thesis on "Application of zirconium CAD / CAM veneers in vital frontal teeth (questionnaire, laboratory and clinical studies)" for the award of educational and scientific degree "Doctor" in the doctoral program "Therapeutic Dental Medicine", in professional field 7.2. Dental Medicine, field of higher education 7. Health and sports.

Author: Dr. Aleksandra Georgieva Pecheva-Stoeva, self-study base PhD student at the Department of Operative Dentistry and Endodontics, Faculty of Dental Medicine - Plovdiv.

Scientific supervisor: Prof. Dr. Snezhana Tsanova, PhD.

1. General presentation of the procedure and the doctoral student

The presented set of materials on paper is complete in accordance with Article 115 (1) of the Procedure for Acquisition of ESD "Doctor" in MU - Plovdiv; Regulations of MU-Plovdiv. The doctoral student has submitted 3 published articles, 3 scientific reports from scientific forums in connection with the dissertation.

2. Brief biographical data of the PhD student

Dr. Aleksandra Georgieva Pecheva-Stoeva completed her secondary education at a language high school in Plovdiv in 2009 and in 2015 her Master's degree at Medical University of Plovdiv, Faculty of Dental Medicine. Since March 2016 she has been an assistant professor at the Department of Operative Dentistry and Endodontics at Medical University of Plovdiv, FDM. She acquired a specialty in Operative Dentistry and Endodontics in May 2019. The PhD student is fluent in spoken and written English.

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

Whereas in the recent past, zirconium restorations were considered exotic rather than routine, today they are about to become commonplace. And all this thanks to digital technologies for their production, which are constantly

improved. Zirconia ceramics itself is also undergoing a very dynamic development. Modifications are introduced that significantly change the translucency and color characteristics of the restorations. The same materials are certified, but data on their behavior in the oral environment are missing or scarce. The protocol for working with these materials is not systematized and summarized. This poses many questions and challenges to dentists.

Therefore, I believe that the PhD thesis "Application of zirconium CAD / CAM veneers in vital frontal teeth (questionnaire, epidemiological, laboratory and clinical studies)" is extremely timely and relevant.

The presented dissertation contains 180 typewritten pages, illustrated with 63 figures and 22 tables. It is structured correctly and contains sections as an introduction; literature review; purpose and tasks; materials and methods; results and discussion with conclusions; conclusion; main contributions; publications and announcements in connection with the dissertation. The bibliography includes 197 sources, of which 3 in Cyrillic and 194 in Latin, of which 36.54% are from the last 10 years.

4. Knowledge of the problem

The introduction is on a page and a half. It is written clearly and accurately introduces the problem.

The literature review is 39 pages long. In a thorough literature review Dr Pecheva considers: the parameters of the smile; veneer design; types of materials of choice for veneers (composite materials, feldspathic glass ceramics, lithium-disilicate ceramics, ceramics with high leucite content, zirconium ceramics); CAD/CAM technologies for their production. The author draws attention to the issues related to the importance of drilling in the preparation of teeth for veneers; the importance of the thickness of the fixing cement; the change of color and translucency during the aging of zirconium ceramics, taking into account the thickness of the material and others.

As a result of the analysis of the literature, Dr Pecheva analytically brings out the unsolved problems and logically aims to study the advantages and disadvantages of CAD/CAM zirconium veneers. The set tasks are 5 and are completely sufficient to achieve the goal of the dissertation.

5. Research methodology

Materials and methods are written on 37 pages. The materials are described in detail. The study is performed on 87 samples, 32 extracted teeth, 24 patients, 262 dentists. The material is richly illustrated with its own materials

and productions for conducting research, which creates clarity and perfectly visualizes them.

6. Characteristics and evaluation of the dissertation

Results and discussion are written on 89 pages. The results are described in detail, illustrated with figures and tables. The condemnation follows the results of each task and ends with conclusions.

Task 1. A survey of 262 dentists in Plovdiv region is conducted. Dr. Pecheva found that about half of the respondents do not make indirect veneers as reasons, which indicate a lack of experience and skills, as well as distrust in the dental laboratory. 90% would be happy if the long standard technology protocol offered by digital technologies is shortened. The performed research is an original contribution to the dissertation development.

Task 2. A study is conducted on how the use of magnifying equipment affects the precision in the preparation of teeth for veneers. Dr. Pecheva proves that all the studied methods show re-sawing and removal of unnecessary amount of HDT, and statistically better results are obtained with a magnifying technique compared to those without the use of such. For the purposes of the research, the author uses precise computer software and multiple measurements of the created samples. This is a confirmatory contribution to the development.

Task 3. The accuracy of the restorations made by CAD/CAM technology is compared – zirconium veneers and veneers of glass-ceramics by press technology (CEM study). An original methodology is used. Digital technology, without a standard footprint and a shorter procedure for the production of zirconium veneers have more precise indicators of marginal adaptation, compared to veneers made by press technology. The comparison is made with earlier literature sources, which shows the significant improvement of digital technologies today (original development contribution).

Task 4. The influence of hydrothermal aging on zirconium veneers is studied. The author proves the influence of artificial aging on their translucency in a one-year period. The color and thickness of the veneers affect their translucency. Therefore, it is especially important not to over-prepare hard dental tissues in preparation for veneers. The study is original, as the author discusses and compares the types of zirconium ceramics, according to the volume percentages of iridium in it and according to the type of crystals in its composition. Today new varieties of zirconium ceramics are constantly being offered, and the literature on how their composition affects the properties of the finished structures during stays in the oral environment is scarce or absent.

Therefore, I consider the *in vitro* study to be innovative, timely and useful. This is an original contribution to the work.

Task 5. For the first time in Bulgaria a clinical study is performed on zirconium veneers. Results show that the application of such restorations is a means of improving the deteriorating aesthetics of patients. An original contribution with practical application is the creation of a precise protocol for the production of zirconium veneers by CAD / CAM technology.

7. Contributions and significance of the development for science and practice

There are 5 contributions with original character and 5 with confirmatory character. I believe that the dissertation is important because it confirms the importance of digital technologies in dentistry and new modifications of zirconium ceramics for everyday practice. It reveals new horizons for dental theory and practice.

8. Evaluation of the dissertation publications

The main parts of Dr. Pecheva's dissertation are published in three original articles, as well as three reports in international scientific forums. The volume of articles and reports in connection with the dissertation is quite sufficient.

9. Personal participation of the PhD student

Dr. Pecheva is a leading author in the research, which emphasizes the personal contribution of the PhD student. The participation of collaborators, which shows the ability of Dr. Pecheva to work in a team.

10. Abstract

The content and quality of the abstract is concluded in 49 pages and meets the requirements. Reflects the main results, conclusions and contributions achieved in the dissertation.

11. Critical remarks and recommendations

I have no significant critical remarks on the completed PhD thesis.

12. Personal impressions

Dr. Pecheva has performed a significant amount of work, the result of which is the presented dissertation. The development is labor-intensive, related to various and voluminous laboratory and clinical studies, which the dissertation student has done excellently. The way of presenting the research is impressive, as well as the logical and detailed discussion of the obtained results and the exact conclusions. The work is perfectly designed, understandable and easy to

understand. A strong beginning has been set for the future scientific developments of dr. Pecheva.

13. Recommendations for future use of dissertation contributions and results

As Dr. Aleksandra Georgieva Pecheva-Stoeva proves that 48.7% of dentists make veneers due to lack of adequate skills and knowledge. The contributions of the present work are important for the daily practice of dentists. Probably a series of lectures, seminars, printed materials (practical guide, monograph or study), etc. would be a guideline for updating the knowledge of students, specialists and dentists in this area.

With this dissertation, Dr. Pecheva points to new problems that can be used for further research.

CONCLUSION

The dissertation contains *scientific, scientific-applied and applied results, which represent an original contribution to science and meet all the requirements* of the Law for the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for application of ZRASRB and the respective. The presented materials and dissertation results fully comply with the specific requirements of MU - Plovdiv.

The dissertation shows that the doctoral student Dr. Aleksandra Georgieva Pecheva-Stoeva has in-depth theoretical knowledge and professional skills in the scientific specialty "Therapeutic Dental Medicine", in professional field 7.2. Dental Medicine, field of higher education 7. Healthcare and sports by demonstrating qualities and skills for independent research.

Due to the above, I confidently give *my positive assessment* of the research presented by the above peer-reviewed dissertation, abstract, results and contributions, and *I invite the esteemed scientific jury to award the educational and scientific degree 'Doctor'* to Dr. Aleksandra Georgieva Pecheva-Stoeva in a doctoral program in "Therapeutic Dental Medicine", in a professional field 7.2. Dental Medicine, field of higher education 7. Health and sports.

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Sofia


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