



To
The Chair of the Scientific jury
According to Order № P - 102/25.01.2022
Of the Rector of MU-Plovdiv
Bul. Vasil Aprilov 15A, 4002 Plovdiv

According to Art.30 of the regulations for application of the Law for development of the academic staff in the Republic of Bulgaria in accordance with procedure for awarding educational and scientific degree “Doctor” to Dr. Lilyana Hristova Shtereva self-training doctoral student in Department “Pediatric dentistry”, Faculty of Dental Medicine, Medical University of Plovdiv, after preliminary discussion by the extended Department Council (ex. № 142 / 04.11.2022) and acceptance by the Faculty Council (ex. № 9 / 09.12.2021) of the Faculty of Dental Medicine of the developed dissertation on the topic:

“Diagnostics and control of silanization of first permanent molars”

with academic supervisor Assoc. Prof. Dr. Veselina Kondeva-Glavinkova, PhD

Attached I present: Review

In regard with the procedure awarding “Doctoral degree”

Of **Dr. Lilyana Hristova Shtereva**, self-training PhD student at the department of Pediatric Dentistry, FDM, MU-Plovdiv

Prepared the review:

Prof. Dr. Naliya Hristova Gateva-Grancharova, PhD

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REVIEW

By Prof. Dr. Naliya Hristova Gateva-Grancharova, PhD
Faculty of Dental Medicine - Sofia
Department of Pediatric Dentistry

In accordance with the procedure for awarding educational and **scientific degree “Doctor”** in doctoral program “Pediatric dentistry” of **Dr. Lilyana Hristova Shtereva**, self-training doctoral student at the department of Pediatric Dentistry, FDM, MU-Plovdiv **for the development of dissertation on the theme: “Diagnosticis and control of silanization of first permanent molars”** with academic supervisor Assoc. Prof. Dr. Veselina Kondeva-Glavinkova, PhD, in professional field 7.2. "Dental Medicine" and scientific specialty "Pediatric Dentistry", sphere of higher education 7. Health and sports.

The presented set of materials on paper and electronic media is in accordance with Art. 115(1) of the Procedure for awarding "doctoral degree" in MU - Plovdiv; Regulations of MU-Plovdiv from 06.11.2014.

I. Biographical data and professional development.

Dr. Lilyana Hristova Shtereva was born on November 8, 1991 in the city of Plovdiv. She graduated from high school in 2010. ELS "Plovdiv" Plovdiv, with English language. In 2016 she graduated from FDM, MU-Plovdiv. In 2017, through a competition, she was appointed as a full-time assistant at the Department of Pediatric Dentistry, FDM, MU - Plovdiv, where she still works today.

Dr. Shtereva conducts exercises for students from second to fifth year, in Bulgarian and English language. She is a specializing in Pediatric Dentistry.

Dr. Shtereva is a member of BDA, BSSDM, IAPDN, APD.

Fluent in written and spoken English and German language.

II. Structure of the dissertation

The presented dissertation is written on 165 pages, of which: Contents - 1 page; Abbreviations used - 1 page; Introduction - 1 page; Literary review - 42 pages; Purpose and tasks - 2 pages; Material and methods - 11 pages; Own research - 76 pages; Main conclusions - 2 pages; Contributions - 1 page; Bibliography - 15 pages; Applications - 12 pages; It is illustrated with 11 figures and 1 table and 6 appendices. The bibliography includes 259 titles, of which 6 in Cyrillic and 253 in Latin. A review of the bibliography shows a serious study of the literature by the doctoral student.

The structure, design and technical implementation of the dissertation is at a good level and meet the procedural requirements.

III. Significance of the theme

Dental caries is a leading oral disease among children and is defined as the only most common chronic childhood disease. It is a process that lasts throughout an individual's life and can occur at any age after a tooth eruption. The WHO recognizes dental caries as a major health problem in most industrialized countries, where 60-90% of children and most adults are affected by the disease. A global study conducted by the WHO in 2016 shows that more than half of the world's population (3.58 billion people) has caries of permanent teeth. The Global Burden of Disease study (1990-2017) found that achieving oral health globally is still a major challenge.

Occlusal carious lesions are the first lesions to develop and be observed in both dentitions and account for 90% of the total incidence of the disease in children and adolescents. The carious process can begin simultaneously in different pits and fissures and quickly cover the entire occlusal surface. In the case of permanent molars, this can happen even before they have fully erupted. As a result, most of the occlusal surface of the tooth is destroyed. In the absence of timely dental care, occlusal caries lesions in newly erupted permanent molars is rapidly complicated by pulp involvement and together with incomplete root development, creating a high risk of premature loss of the main masticatory tooth.

At the same time the development of carious lesions is preventable! This can be achieved both by limiting the possibility of starting them and by managing them by applying measures to stop and reverse the demineralization process in the early stages of the disease, before the formation of cavitation.

One of the biggest challenges in daily dental practice is the early and correct diagnosis (such as the presence, depth and activity) of carious lesions on occlusal surfaces (especially the first permanent molars). At the moment, it is defined as highly subjective and depends largely on the experience of the dentist. Available additional modern techniques such as fiber-optic trans illumination, laser fluorescence - DIAGNOdent, camera systems to visualize fluorescence (Sopro, Acteon, France; Vistacam iX, Dürer, Bietigheim-Bissingen, Germany) are defined as sensitive and helpful to a certain degree, but also run the risk of false-positive results. This makes the topic of the dissertation, developed by Dr. Shtereva relevant and significant.

IV. Knowledge of the problem by the doctoral candidate

Dr. Shtereva demonstrates a good knowledge of the scientific literature on this issue. With a short introduction, the author presents the essence of the topic she developed.

The literature review is 42 pages long and demonstrates the doctoral student's ability to research and analyze in detail the available scientific literature on the topic she is considering. It examines the beginning and historical development of silanization, examines the different types of sealants and materials used for this purpose. The indications and contraindications for conducting the silanization procedure are indicated, summarized results of the effectiveness of preventive and therapeutic silanization are presented. Different diagnostic methods used in diagnostics to assess the health of the occlusal surface are considered and compared, indicating

their advantages and disadvantages. Information is presented in connection with the National Program for Prevention of Oral Diseases in Children 0-18 years in Bulgaria.

The literature review illustrates a very good knowledge and handling of terminology in the field of the developed topic.

I assess the literature review as very informative, giving the right direction for the need to conduct their own research.

V. Research methodology

The purpose of the scientific work is precisely and clearly stated. It is realized through six set tasks, with two subtasks on the first and fifth task, with three subtasks on the second task and four subtasks on the third and fourth task. The tasks are logically arranged according to the set scientific goal.

These include: selection of patients according to the risk of developing oral diseases in two target groups of 5-6 year olds with newly erupting first permanent molars and 7-8 year olds with first permanent molars in occlusion; carrying out silanization according to indication with sealant and glass-ionomer cement and control of silanization by visual and fluorescent methods for diagnosis of the 3rd, 6th and 12th month; monitoring the caries-prophylactic effect of sealants by visual and fluorescent methods for diagnosis at the 3rd, 6th and 12th month; monitoring the retention of sealants by visual methods for diagnosis at 3, 6 and 12 months; evaluation of the applied visual and fluorescent methods for diagnosis of occlusal caries and control of silanization; preparation of recommendations for the application of sealants according to the risk and condition of the eruption.

All tasks help the dissertant to successfully achieve the goal. Appropriate clinical and statistical methods have been used for the conducted research, which allows the realization of the clinical research and demonstrates the in-depth scientific thinking of the dissertant. The methodologies are described in detail. The Ryge criteria have been modified so that they can be applied for the purposes of the study. The monitoring of the retentiveness of the sealants is performed by recoding the ICDAS II System and frequency analysis of the data depending on the retentiveness of the sealant.

To determine the reliability of the results obtained by different methods, the dissertation student made ROC - data analysis, the resulting ROC curve describes the dependence of the sensitivity and specificity of the applied visual and fluorescent methods for diagnosis of occlusal caries and control of the silanization.

The statistical analysis of the collected data is done professionally. The various statistical methods are adequately used and enable the dissertation to reach reliable results and conclusions. The processing and analysis of data and results were performed using a specialized software product IBM SPSS, version 25.0 and MS Excel 2019. The accepted critical level of significance in testing the null hypothesis H_0 is $\alpha = 0.05$ (Z criterion = 1.96) with a guarantee probability of 95%.

VI. Characteristics and evaluation of the scientific work

The dissertation is a personal work of the doctoral student. Its structure is in accordance with modern requirements and contains all the necessary sections: introduction, literature review, purpose and tasks, material and methods, results and discussion of every tasks, conclusions, contributions and bibliography.

The obtained results and their discussion are an essential part of Dr. Shtereva's scientific development. They are well illustrated by tables and diagrams presenting statistical data processing and derived statistical reliability and dependencies. The diagrams, tables and figures are clear and properly structured.

The results of the doctoral student's own research are presented in detail. They are subjected to analytical discussion and comparison with what is known in the specialized literature on the issues considered by the dissertant, which deserves high praise.

Each task ends with conclusions. This shows the author's ability to summarize the results and draws very accurate conclusions and helps to better perceive the results.

Interesting is the study related to frequency analysis of data depending on the absence or presence of caries in the jaws for the two studied groups of 7-8 years and 5-6 years, as well as the assessment of the retention of the sealant at different control time intervals. Also noteworthy is the study that evaluates the effectiveness of Vista Proof (based on the fluorescence of dental structures), high-tech and quite expensive, which shows more false-positive results and can lead to unnecessary treatment of healthy teeth.

With the obtained results and their analysis Dr. Shtereva has fully achieved the goals and objectives of her dissertation.

In the discussion the doctoral student demonstrates good competence and criticality in the comparative analysis of his own results with the data published in the scientific literature.

The conclusions made are correctly formulated and are a logical consequence of the set goals and objectives. They reflect in a synthesized form the results achieved from their own research and the discussion and bring the scientific contribution of a dissertation.

The contributions formulated by Dr. Lilyana Shtereva are correct. They are divided into those of original and confirmatory nature and are the personal work of the doctoral student.

The contributions of the dissertation justify the efforts made, enrich what is known so far in terms of the effectiveness of preventive silanization of the first permanent molars and clearly outline the role and importance of Pediatric Dentistry for achieving good oral health.

1. Contributions with an original character

- 1.1 For the first time in our country the reliability of the three diagnostic methods is compared: visual diagnostics according to the ICDAS II system, diagnostics under magnification with the help of VistaCamiX Macro according to the ICDAS II system, diagnostics with the Vista Proof fluorescent camera and the modified Ryge criteria to

monitor the caries prophylactic effect and retentiveness of sealants, and the results are compared within a 12-month clinical trial.

- 1.2 For the first time in Bulgaria VistaCam-Macro and Proof FC are used for one-year tracking of silanized tooth surfaces of the first permanent molars of children aged 5-8 years.
- 1.3 For the first time in the country the retention and caries-prophylactic effect of a GIC in newly erupting first permanent molars for 12 months is monitored.
- 1.4 For the first time in the country, recommendations have been made for the application of sealants according to the risk and the stage of eruption.

2. Contributions of a confirmatory nature

- 2.1. The excellent caries-prophylactic effect of a GIC used for silanization in the newly erupting first permanent molars and its lower retention have been studied.
- 2.2. The excellent caries-prophylactic effect of a resin-based sealant in the first permanent molars in occlusion and its excellent retention have been studied.
- 2.3. The need for silanization of primary molars of children in the high-risk group has been studied.
- 2.4. The excellent comparability between visual diagnostics with and without magnification according to the ICDAS II system has been studied.
- 2.5. It has been proven that the use of Vista Proof FC is unsuccessful for tracking occlusal surfaces silanized with Fuji Triage Pink due to the overdiagnosis it makes.

The dissertation is written in good scientific language, precise in terms of terminology. Technically, the dissertation is designed according to the requirements.

I have no critical remarks about the research and the materials presented.

I recommend Dr. Shtereva to continue monitoring the placed sealants by publishing the later results. A significant contribution to her acquired competence to work with Vista Proof FC, as well as the fact that she has this device, is to conduct future research to evaluate the effectiveness of therapeutic silanization of initial occlusive carious lesions.

VII. Evaluation of the publications and personal contribution of the doctoral student

The scientific publications in connection with the dissertation are 3 real publications in which Dr. Shtereva is a leading author. She has 5 participations in Bulgarian and 1 in international forums, where she is also a leading author.

VIII. Author's summary

The author's summary is prepared according to the requirements and faithfully reproduces in summary form on 53 pages the most important of the content of the dissertation. It consists of parts that present the structure and content of the dissertation, reflecting the main results achieved by the dissertation. Her scientific conclusions, contributions, publications and participation in Bulgarian and international scientific forums are included.

IX. Conclusion

Dr. Lilyana Hristova Shtereva presents a completed and very well-designed dissertation with thematic relevance, containing scientific results that represent an original contribution to science and meets the requirements of Law for development of the academic staff in the Republic of Bulgaria and the Regulations of MU - Plovdiv.

The topic developed by the doctoral student is current and timely. The dissertation is thoroughly developed, well-illustrated and presented in accessible and very good professional language. This is the reason to evaluate positively the dissertation on "Diagnostics and control of silanization of first permanent molars".

The presented scientific work shows that Dr. Shtereva has in-depth theoretical knowledge and professional skills in the field of Pediatric Dentistry, showing her qualities and skills to analyze scientific information on a topic, to conduct independent research and summarize the results, and to publish scientific articles.

I give my positive evaluation of the presented dissertation on the topic - "Diagnostics and control of silanization of first permanent molars" and I will confidently vote "YES". I invite the esteemed scientific jury to award the educational and scientific degree "Doctor" to Dr. Lilyana Hristova Shtereva in a doctoral program in "Pediatric Dentistry".

Sofia
09.02.2022

Prof. Dr. Naliya Hristova Gateva-Grancharova, PhD

