

REVIEW

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Subject: Dissertation for awarding the educational and scientific degree "Doctor" in the Field of higher education: 4. Natural Sciences, Mathematics and Informatics, Professional field: 4.1. Biological Sciences, Scientific specialty: Anthropology

Author: Boyan Valentinov Kirilov

Topic: "Basic Anthropological Signs and Eruption of Permanent Teeth in Children and Adolescents from 5 to 12 Years of Age"

Scientific Supervisor: Assoc. Prof. Ivayla Ivanova-Pandurska, PhD (IEMPAM-BAS),

Scientific Consultant: Chief Assistant Professor Yanitsa Zhecheva, PhD (IEMPAM-BAS)

1. **General presentation** of the procedure and the doctoral student. By order No. NO-05-05-6/2.10.2025 of the Director of IEMPAM-BAS, I have been appointed a member of the scientific jury in connection with the procedure for the defense of the dissertation on the topic "Basic anthropological signs and eruption of permanent teeth in children and adolescents from 5 to 12 years of age" for the acquisition of the ONS "Doctor" in the field of higher education 4. Natural sciences, mathematics and informatics 4.3. Biological sciences, doctoral program Anthropology. The author of the dissertation is Boyan Valentinov Kirilov, a doctoral student in an independent form of study at the "Anthropology and Anatomy" section of IEMPAM-BAS with scientific supervisor Assoc. Prof. Ivayla Ivanova-Pandurska, PhD (IEMPAM-BAS). To prepare the review, I received the materials required by the Regulations on the conditions and procedure for acquiring scientific degrees and holding academic positions at IEMPAM-BAS.

Doctoral student Boyan Valentinov Kirilov was born in Sofia, where he completed his secondary education. In 2019, he graduated from the Medical University-Sofia, Faculty of Dental Medicine with a master's degree in "Doctor of Dental Medicine".

From 2019 to 2024, he worked as a dentist at AGPPMP "SiD" Denti OOD, Sofia. From 2024 to the present, he has been a manager at AIPDP "Dentalitsa", Sofia and works as a dentist.

He was enrolled as a doctoral student in independent training in the Section "Anthropology and Anatomy" of IEMPAM-BAS for a period of 3 (three) years (from 01.01.2020 to 01.01.2022) by order of the Director of IEMPAM No. RD-15-7/29.01.2020. He was expelled from doctoral studies with the right to defend his thesis by order - RD-15-116/27.11.2023 after successfully passing the internal defense.

2. **Relevance of the topic.** Cephalometric characteristics reflect the specifics of the physical development of children and adolescents during different age periods. They are a necessary element for establishing the regularities in growth and development and monitoring their health status. The dissertation is dedicated to the study and characterization of the

relationship between cephalometric dimensions and the process of tooth eruption, as important indicators for the normal development of the maxillofacial region of the child.

3. Knowledge of the problem. The introduction, the provided basic information about growth and development in children and adolescents, as well as studies analyzing the relationship between the eruption of permanent teeth, cephalo- and somatometric signs and physical fitness, along with the creative use of the cited literary material, show knowledge of the state of the problem treated in the dissertation by the doctoral student.

4. Characteristics and evaluation of the dissertation work and contributions. The dissertation is structured according to generally accepted requirements - introduction, literature review, aim and objectives, material and methods, results, discussion, and conclusions. It is presented on 134 pages and is illustrated with 25 tables and 28 figures. 165 literary sources are cited, of which 41 are in Cyrillic and 124 in Latin.

The Literature Review offers a historical overview of the problem, analyzing the results of various authors on the characteristics of physical development. It provides data from scientific literature on different schemes for periodizing the postnatal ontogenesis of a person. Anthropological studies on children and adolescents, along with assessments of body composition using body mass index, are presented in sufficient detail. The review includes data on cephalometric dimensions and indices used to monitor normal age-related development and to identify congenital or acquired anomalies in maxillofacial and orthodontic practices promptly. Research on changes in anthropological dimensions such as height, body weight, and body mass index in children and adolescents—reflecting growth and maturation during different periods—is also discussed. The review notes a limited number of studies focused on dental development. Tooth eruption is an important indicator of the normal development of the maxillofacial complex, as well as individual teeth, and is used to determine biological age and maturity.

The analysis of the reviewed specialized literature showed the relevance and significance of a modern assessment of physical development, including dental status of children from 5 to 12 years of age, which gave us reason to formulate the goal and objectives of this dissertation.

The aim of this study is to study and characterize the specifics of physical development and eruption of permanent teeth in children and adolescents aged 5 to 12 years using anthropological methods. To achieve this aim, the doctoral candidate has set himself five tasks to assess the relationships between the eruption of permanent teeth and facial dimensions, basic anthropometric features and BMI.

The study material is sufficient in volume, properly selected and structured, well documented and precisely registered, which guarantees the reliability of the results.

Research methodology. The doctoral candidate has used an anthropological program that includes features grouped according to their morphofunctional similarity - cephalometric, somatometric and odontometric features and indices and body security, with which he obtains an adequate answer to the tasks solved in the dissertation work. The statistical methods are appropriately selected with the informativeness necessary for the study. Primary statistical

processing of the data was performed using descriptive analysis and index characterization. Additionally, the data were processed using parametric analysis and graphical analysis.

Results. The results of the study are clearly demonstrated and analyzed in the presented documentation (graphs and tables). The data from the studied anthropometric signs and the eruption of permanent teeth provide information about the growth of children and adolescents during the age period 5-12 years. The development and eruption of teeth are inextricably linked to the growth of maxillofacial dimensions. The results obtained confirm the dependence between the process of tooth eruption and craniofacial growth. Using correlation analysis, the doctoral student established statistically significant positive correlations between anthropometric signs and the individual categories of erupted teeth in both sexes. Despite the lack of pronounced inter-sex differences in terms of correlation dependencies between the signs, a greater number of correlations of moderate and significant degree were found in girls, probably related to their more advanced morphofunctional development.

The study of the relationship between BMI and tooth eruption shows in both sexes the highest percentage of erupted teeth in obese children, followed by overweight. The author observed the greatest differences, but without reaching statistical significance, in the eruption of permanent teeth between the individual categories of body protection in the first molars of the upper jaw.

When comparing the caries of the studied individuals, the doctoral student established a positive correlation between caries and BMI - the smallest percentage of carious teeth in children with normal weight, and the largest (except for the lower left molar) in obese children.

The conclusions accurately summarize the study's results. There are regularities in the relationships between morphofunctional maturity and the development of the facial part of the skull in children. In girls, earlier eruptions of permanent teeth is observed, as well as more erupted teeth than in boys. The distribution of children according to BMI shows a higher percentage of overweight and underweight children in girls, while in boys, the percentage of obesity is higher. In girls, a trend toward greater correlation between anthropometric measures, BMI, and tooth eruption was observed.

Overweight children show a higher percentage of erupted teeth than children with normal and lower weight.

Assessment of the publications and personal contribution of the doctoral student. The main results of the dissertation have been published in *Acta morphologica et anthropologica*, 2021, *Journal of IMAB*, 2003, *Anthropological review*, 2025, *Comptes rendus de l'Académie bulgare des Sciences*, 2025. There are also 3 communications at scientific forums. The publications are co-authored, and in all of them the doctoral student is the lead author, which gives me reason to believe that he has a major contribution to the results.

The abstract is structured correctly, reflecting the content, main results and contributions of the dissertation work.

My recommendations for future use of the dissertation contributions and results are for their application in the further study and expansion of this issue, in which the results obtained should also be published in independent scientific articles.

Conclusion. Boyan Kirilov's dissertation work examines a problem that is of scientific and practical interest in the field of anthropological science. Scientific results have been obtained, enriching the knowledge of providing new and updated data on the eruption of permanent teeth and the development of the craniofacial complex in children and adolescents from 5 to 12 years of age. The author conducted for the first time in our country a targeted anthropological study to assess the relationship between cephalometric signs and the eruption of permanent teeth in children and adolescents. This is a real scientific contribution. The presentation and layout of the dissertation work and the abstract are very good. A large amount of work and difficult-to-perform work has been completed. This shows that the doctoral student possesses theoretical knowledge and professional skills in the scientific specialty, as well as skills for independent scientific research. The materials and documents submitted under the procedure fully meet the requirements of the Act on the Development of Academic Staff in the Republic of Bulgaria, the Regulations for the Implementation of this Act, and the Regulations for the Acquisition of the educational and scientific degree "Doctor" at the IEMPAM of the Bulgarian Academy of Sciences.

Based on the above, I give a positive assessment of the scientific research conducted in the dissertation work, and I propose to the esteemed scientific jury to award Boyan Valentinov Kirilov the educational and scientific degree "Doctor" in the Field of higher education 4. Natural Sciences, Mathematics and Informatics, Professional field 4.3 Biological Sciences, Scientific specialty Anthropology.

Prof. Stefan Sivkov, MD, PhD



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