

## OPINION

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**Subject:** Dissertation work for the award of the PhD "Doctor" in Higher education field 7. Health care and sports, Professional direction 7.1. Medicine, Scientific specialty Anatomy, histology, and cytology

**Author:** Zdravka Damyanova Harizanova-Valcheva

**Topic:** "ANTHROPOLOGICAL CHARACTERISTICS OF THE CLINICAL DENTAL CROWN IN ETHNIC BULGARIANS"

**Scientific supervisors:** Assoc. Prof. Atanas Baltadjiev, MD (Department of Anatomy, Histology, and Embryology, Medical University-Plovdiv), Assoc. Dr. Miroslava Yordanova, MD (Department of Orthodontics, Medical University -Plovdiv)

1. **General presentation of the procedure and the doctoral student.** By order No. R-875/04.05.2022 of the Rector of the Medical University-Plovdiv, I have been appointed as a member of the scientific jury in connection with the procedure for the defense of the dissertation work on the topic "Anthropological characteristics of the clinical dental crown in ethnic Bulgarians" for the acquisition of ONS "Doctor" in Higher education field 7. Health care and sports, Professional direction 7.1. Medicine, Scientific specialty Anatomy, histology, and cytology. The author of the dissertation is Zdravka Damyanova Harizanova-Valcheva - a doctoral student in an independent form of study at the Department of Anatomy, Histology and Cytology of the Medical University of Plovdiv with scientific supervisors Assoc. Dr. Atanas Baltadjiev, PhD (Department of Anatomy, Histology and Embryology, MU-Plovdiv), Assoc. Dr. Miroslava Yordanova, MD (Department of Orthodontics, Medical University-Plovdiv). To prepare the review, I received the materials required by the Regulations for the conditions and procedures for acquiring scientific degrees and holding academic positions at the Medical University of Plovdiv.

Doctoral student Zdravka Harizanova-Valcheva was born in the town of Pazardzhik, where she completed her secondary education at the "Bertolt Brecht" Language School. In 2006, she completed her education at the Medical University-Plovdiv, Faculty of Dental Medicine with a master degree "Doctor of Dental Medicine".

From 2006 until now, she has been working as a dentist in the Dental Practice "Dr. Harizanova". From 2019 until now, she works as an assistant in anatomy, histology and cytology at the Department of Anatomy, Histology and Embryology of the Medical University of Plovdiv. By order No. P-153 of 02/09/2021, she was enrolled in the specialization "Anatomy, Histology and Cytology" at the Department of Anatomy, Histology and Embryology of the Medical University of Plovdiv.

By order P-457/01.04.2021, she was enrolled as a doctoral student of independent training in the doctoral program "Anatomy, Histology and Cytology" at the Department of Anatomy,



Histology, and Embryology, Medical University-Plovdiv. She completed her doctoral studies with the right to defense by order P-234/15.02.2022 after successfully passing an internal defense.

**2. Relevance of the topic.** The dissertation is dedicated to the study of the odontometric profile of a sample of the Bulgarian population, making a comparative analysis of gender differences. Sexual dimorphism varies among populations, making the collection of population-specific dental size data particularly important. Determining sex by dental size is a particularly important step in creating the biological profile of unidentified human remains of any forensic anthropological study. The use of odontometric dimensions is also important for orthodontic treatment planning, in order to achieve the best possible functional and aesthetic results.

**3. Knowing the problem.** The introduction, the provided basic information about the emergence of odontometry and its use for characterizing the population, as well as 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. Characterization and evaluation of the dissertation work and contributions.** The dissertation is structured according to generally accepted requirements - introduction, literature review, aim and tasks, material and methods, results, discussion, and conclusions. It is presented on 171 standard pages and contains 12 figures and 88 tables. The literature used includes 203 sources, of which 13 are in Cyrillic and 190 are in Latin.

**The Literature Review** provides a historical overview of the meaning, origin, and levels of manifestation of sexual dimorphism in humans. Historical, archeological, and ethnographic data on the differences in the dimensions of the human skeleton between men and women are presented. Gender differences in tooth crown size and their correlation with body size are discussed. It has been noted that sexual dimorphism is an ontogenetically and phylogenetically determined biological marker with multifactorial determinism. The embryogenesis of teeth has been considered in sufficient detail, and the influence of sex hormones on odontogenesis has been discussed. The application of teeth to anthropological, genetic, and forensic research is discussed. Special attention is paid to the specificity of the shape and size of teeth in different human populations. Attention is paid to the importance of dental indices for comparing dental variation, development, cultural and dietary habits, and adaptation processes between people from different populations, as well as between past and present populations. The review of the literature allows outlining the odontometric profile as a population-specific marker, important and applicable for identification in forensic medicine.

**The aim** of the present study is to determine the odontometric profile of people from the Bulgarian population and to make a comparison between the two sexes from the Bulgarian population, as well as with those from other populations.

The research 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 student used reliable and sufficient anthropometric research methods to achieve the set goal, with which she received an adequate answer to the tasks solved in the dissertation work. Statistical methods are appropriately selected with the



informativeness necessary for the study. Primary statistical data processing was performed using descriptive statistics, parametric and graphical analysis.

The "**Results**" chapter occupies 93 pages. The obtained data are clearly demonstrated in the presented documentation (graphs and tables). Diagrams of odontometric indicators, dental and interdental indices in Bulgarian men and women, and other populations were constructed.

The obtained results show a sexual dimorphism for almost all sizes of tooth crowns, with the mean values being higher in males than in females. As there is a higher sexual dimorphism in the teeth of the upper jaw. The medio-distal dimensions of maxillary canines showed the highest degree of sexual dimorphism, followed by those of upper first molars and lower first molars, and lower canines, the differences being of high significance.

Statistically significant differences in tooth size were found in the study between Bulgarians and Serbs, Spaniards, Greeks, Chileans, Indians, and Malaysians. The results show many more statistically significant differences in men than in women. The least differences in tooth sizes were found between the Bulgarian and Serbian and Greek populations, with whom we are also close in terms of genetic origin and geographical location. Variations between crown sizes in different populations are likely due to genetic factors, dietary habits, as well as environmental factors.

Regarding the dental indices, the comparison of the modulus of the crowns for the upper and lower teeth between men and women from the Bulgarian population shows statistically significant differences for the upper canines, upper and lower first molars, with men having higher values. The index of crowns for upper and lower teeth in men and women from the Bulgarian population shows statistically significant differences only for upper and lower canines as well as upper molars. For women, the mean values are higher than for men.

Conclusions accurately summarize the results of the study.

The doctoral student's contributions include:

- A detailed anthropological status of the clinical crowns was made, and dental and interdental indices were calculated in Bulgarians of the Bulgarian population. This allows creation of a modern database regarding the parameters of the clinical crowns of the Bulgarian population.
- Characteristic features of sexual dimorphism in the dental crowns in a sample of the Bulgarian population have been determined (crown height, vestibulo-oral and mediobuccal size); comparison of the odontometric indicators between sexes was made.
- The odontometric indicators between the Bulgarian population and other nations were compared. Dental indices (module and crown index) of modern Bulgarians were calculated, comparing them between the sexes and comparing them with those of other nations.
- The interdental indices of modern people from the Bulgarian population and people from the Eneolithic were compared.
- The reliability of the odontometric indicators in the determination of gender and their application in forensic medical practice for the identification of a person, as well as the application of the calculated indices in dental medicine, were checked.
- Interdental indices were calculated (inter incisor index, premolar index teeth, step-indexes, Bolton index) for the Bulgarian population, a comparison was made between the sexes, with

other peoples, and with people from the Eneolithic, as well as their application in anthropology, forensic medicine, archeology, dental medicine.

**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*, 2020 and 2021, *Scientific works of the Union of Scientists in Bulgaria–Plovdiv*, 2022. There are also three communications at scientific forums. Although the publications are co-authored, in all of them the doctoral student is the leading author, which gives me a reason to believe that she has a major contribution to the results.

**The abstract** is structured properly, displaying the content, main results, and contributions of the dissertation work.

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

**Conclusion.** The dissertation work of Dr. Zdravka Harizanova-Valcheva examines a problem that is of scientific and practical interest in the field of anthropological and odontological science. Scientific results were obtained, enriching the knowledge of the odontometric characteristics in a sample of the Bulgarian population. For the first time in our country, the author determines a detailed anthropological status of the clinical crowns of the Bulgarian population, with characteristic features of the appearance of sexual dimorphism in the Bulgarian population. The dental and interdental indices of modern Bulgarians, their cross-sex comparison, and their comparison with those of other nations were calculated. This is a real scientific contribution. The presentation and layout of the dissertation and the abstract is very good. A large volume and difficult to perform work was carried out. This shows that the doctoral student has theoretical knowledge and professional skills in the scientific specialty, as well as skills for independent scientific research. The submitted materials and documents for the procedure fully comply with the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for the Implementation of this Law, and the Regulations for the Acquisition of the Doctoral Degree in Medical University-Plovdiv.

Based on the above, I give a positive assessment of the scientific research conducted in the dissertation work, proposing to the honorable scientific jury **to award** Dr. Zdravka Harizanova-Valcheva the educational and scientific degree "Doctor" in the Higher education field 7. Health care and sports, Professional direction 7.1 Medicine, Scientific specialty Anatomy, histology, and cytology.



Заличено на основание  
Чл.5 §1, б. "В" Регламент (ЕС)2016/679

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25/07/2022