



REVIEW

From Prof. Dr. Stefan Nedev Stefanov, PhD

Clinic of Rheumatology, Cardiology and Hematology, SBALDB, Sofia

Department of Pediatrics, Medical University, Sofia

of a dissertation for the award of the scientific degree 'Doctor of Science'

in the field of higher education 7. Health and sports,

professional field 7.1. Medicine,

doctoral program "Rheumatology"

Author: Dr. Elena Kirilova Kirilova, PhD

Department: Propaedeutics of Internal Medicine,

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Topic: "Development of a specific national model for prediction of osteoporotic fracture risk and assessment of bone mineral density of the axial skeleton by radiofrequency ultrasound multi spectrometry (REMS)"

The presented set of materials on paper and electronic media is in accordance with ZRASRB, with its Regulations for application, with the Procedure for acquisition of scientific degree "Doctor of Science" in MU - Plovdiv from the Regulations for academic development of MU-Plovdiv.

Dr. Kirilova has attached all the necessary documents.

1. Presentation of the candidate.

Dr. Elena Kirilova graduated in Medicine at Trakia University, Stara Zagora in 2016. During her studies she participated in a University project to study cytokines in autoimmune diseases. She has completed her training in a program for acquiring the clinical specialty Rheumatology. In 2019 she graduated with a master's degree in Public Health and Health Management from the Medical University of Sofia.

She defended her doctorate in 2018 at the Medical Faculty "Carl Gustav Carus" in Dresden, Germany with the topic: "Incidence and risk factors for kidney injury and kidney disease in patients with allogeneic stem cell transplantation-retrospective analysis."

She has professional experience as an assistant in Internal Medicine at Medical faculty and Faculty of health care and public health, Prof. "Dr. Assen Zlatarov" University, Burgas. In 2012 she completed a summer internship in the ERASMUS program in the Department of Neuroradiology at the University of Otto von Guericke in Magdeburg, Germany, and in 2016 a pre-diploma internship in the ERASMUS program at the Carl Gustav Carus University Hospital in Dresden, Germany, as well as specialization in the Stem Cell Transplantation Department. For the period 2016 - 2018 she was a member of the German Society of Nephrology and has 2 awards for congresses in Berlin and Mannheim.

She has participated in national and international courses:

- 2016 International Course in "Joint Aspiration, Joint Injection and Synovial Fluid Analysis" in Abbazia di Praglia, Italy;
- 2017 EULAR (European League Against Rheumatism) postgraduate course in Belgrade, Serbia;
- 2018 individual course in Radiofrequency Echographic Multi Spectrometry (REMS) in Lecce, Italy;

- 2020 is licensed as a world university reference center for REMS, and in the same year has obtained a certificate for work with dual-energy X-ray absorptiometry (DEXA) at the Medical University of Pleven;

- 2021 ultrasound course of BAMSU (Bulgarian Association for Skeletal Muscle Ultrasound) under the guidance of Prof. Batalov.

She is fluent in German and English.

EVALUATION of research activity

Dr. Elena Kirilova has presented a total of 19 scientific publications related to the dissertation (6 publications in foreign scientific journals and 10 publications in Bulgarian scientific journals), corresponding to 262.5 points on indicator D of the minimum requirements, 1 dissertation and 1 abstract, 1 published monograph in connection with the dissertation and a total of 230 points for the citations under point E of the minimum requirements. Quantitative scientometric indicators are sufficient under the current procedure for the Scientific Degree "Doctor of Science", required by MU Plovdiv.

ACTUALITY of the problem:

The dissertation written by Dr. Kirilova, related to the socially significant disease osteoporosis, as well as fracture risk, presents a topical and significant problem. The creation of a specific for the Bulgarian population national "FRAX" model allows every Bulgarian to accurately assess his fracture risk, because based on the model developed, its fracture risk will be compared with specific national data. The national fracture risk model thus created is important for practice.

The author works with an innovative ultrasound methodology for assessment of BMD_{US} of the axial skeleton, called "Radiofrequency ultrasound multi spectrometer (REMS)" and presents the results obtained in 324 women. The aim of the study is clearly defined and includes a study of hip fractures among the Bulgarian population to create a specific national model for predicting osteoporotic fracture risk and assessment of BMD_{US} of the axial skeleton by radiofrequency echographic multispectrometry (REMS). Within the dissertation work 11 tasks are formed.

METHODOLOGY OF THE RESEARCH:

The methods used correspond to the set goal and tasks. They are original and do not repeat the research from the previous dissertation of Dr. Kirilova. The statistical analysis is done with a reliable statistical program (SPSS software, v.19). Relevant statistical analyzes have been performed and the data have been correctly interpreted and well illustrated in tables and graphs.

CHARACTERISTICS of the dissertation:

The literature review is comprehensive and in-depth, covering 54 pages and 478 literature sources.

The chapter "Clinical material and methods" is written on 19 pages. The cases of hip fractures (with ICD: S72.0, S72.1 and S72.2) in Stara Zagora region for the years 2015, 2016 and 2017 in people aged ≥ 40 years, divided into 5-year intervals for men and women., as well as osteodensitometry of the axial skeleton was performed in 324 women with the innovative REMS technology.

The results are written on 41 pages and follow the tasks sequentially.

The discussion is presented on 23 pages and shows the ability of the author to compare the results with previously published studies and to discuss them critically with previous studies.

The conclusions and contributions are described accurately and concisely.

As a result of Dr. Kirilova's research project, the Bulgarian FRAX model was created according to a world standard. It is an important tool that can be successfully used by every Bulgarian citizen as well as by modern medical science for the purpose of important summaries of health, the need for prevention and treatment of osteoporosis.

Dr. Kirilova introduces in clinical practice for the first time in Bulgaria the innovative for the world REMS axial osteodensitometry. The results obtained by her are quoted by some of the world's most competent experts in osteoporosis.

Abstract

The abstract is written on 64 pages with eight tables and 22 figures. It is prepared in accordance with the requirements of the regulations of MU Plovdiv, reflecting the dissertation research, results and conclusions.

Critical notes

Dr. Kirilova has shaped her scientific work extremely precisely and has presented the results and conclusions of her research in an accessible way. It has complied with, changed and arranged the data according to all remarks of a technical nature, indicated by the members of the Department Council in pre-defense. I have no critical remarks on the peer-reviewed procedural documents.

Recommendations for future use of dissertation contributions and results

The methods for fracture risk assessment introduced by Dr. Elena Kirilova have interdisciplinary applicability. On this basis, it is possible to establish a national interdisciplinary scientific and clinical team for the prevention of osteoporotic fractures.

CONCLUSION:

The dissertation contains scientific, scientific-applied and applied results, which represent an original contribution to science. Due to the qualities of the work and the complied with the requirements of ZRASRB and the Regulations for its application with the minimum requirements, as well as the criteria of the Regulation of MU Plovdiv for acquisition of scientific degree, I give my **positive evaluation** and propose to the Scientific Jury to award the degree "Doctor of Science". Doctoral program "Rheumatology" in professional field 7.1. Medicine of Dr. Elena Kirilova Kirilova.

16.05.2021

Prof. Dr. Stefan Nedev Stefanov, MD

