

STATEMENT

by

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regarding: the dissertation for the award of the educational and scientific degree “Doctor (PhD)”. Field of Higher Education: 7. Healthcare and Sport. Professional Direction: 7.1 Medicine. Scientific Specialty: General Medicine

to **Magdalena Ivanova Bosheva MD**

on the topic: **“Physical Activity in Hemodialysis Patients and Opportunities for Its Optimization”**

Supervisor: **Prof. Valentina Madzhova, MD, PhD** ’

By decision of the Chair of the Scientific Jury and pursuant to Rector’s Order No. R-109-402 of 01.10.2025, I have been appointed to present an opinion on the dissertation of Dr. Magdalena Ivanova Bosheva, entitled “Physical Activity in Hemodialysis Patients and Opportunities for Its Optimization,” for the award of the educational and scientific degree “Doctor” in the scientific specialty General Medicine.

The present opinion has been prepared and submitted in accordance with the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB) and its Implementing Regulations (PPZRASRB).

Brief biographical data of the doctoral candidate

Dr. Magdalena Ivanova Bosheva was born on 21.02.1995. In 2020 she graduated as Master of Medicine at the Medical University of Varna, and in 2023 as Master in Health Management and Medico-Social Care at MU-Varna. Dr. Bosheva is an Assistant Professor at the Department of General Practice, MU-Varna. She works as a physician and resident in Physical and Rehabilitation Medicine at the Clinic of Physical and Rehabilitation Medicine, St. Marina University Hospital, Varna.

Significance and relevance of the topic

Dr. Bosheva’s dissertation addresses a current and important practical problem of

interdisciplinary significance. Chronic kidney failure (CKF) is a clinico-laboratory syndrome associated with progressive loss of renal function due to irreversible nephrosclerosis. In recent years, the term chronic kidney disease (CKD) has gained broader use, reflecting the continuity and progression of renal damage. CKD is a serious global health problem, associated with reduced life expectancy. It leads to severe complications that often cause disability, placing at the forefront the need for measures to improve quality of life—which makes Dr. Bosheva's dissertation particularly timely.

Scope and structure

Dr. Bosheva's dissertation comprises 147 standard pages, illustrated with 33 figures, 17 tables, and 1 appendix. The bibliography includes 356 sources, of which 13 are in Cyrillic and 343 in Latin script. It concludes with conclusions that support the need to research the dissertation topic. The issues addressed and the content are appropriate for a dissertation and are of interest not only to specialists in Physical and Rehabilitation Medicine, but also to a broader range of professionals engaged in managing CKD.

Methodology

Aim: The aim of this dissertation is to demonstrate that the use of specialized intradialytic kinesitherapy improves physical activity, social rehabilitation, and quality of life in patients with end-stage kidney disease (ESKD).

To achieve this aim, the doctoral candidate formulated five main tasks:

1. Assess physical activity in two groups (experimental and control) of CKD patients on dialysis using: Duke Activity Status Index (DASI), 6-Minute Walk Test (6MWT), and Sit-to-Stand test (STS60).
2. Examine the impact of chronic dialysis on physical activity and individual quality of life using the Kidney Disease Quality of Life Short Form (KDQOL-SF).
3. Evaluate the effect of specialized cardio-cycle exercises on the clinical status of chronic hemodialysis patients.
4. Develop and apply an innovative specialized questionnaire to identify main reasons for deterioration in physical activity and to stratify risk factors.

5. Create an original algorithm for implementing intradialytic exercise to optimize clinical practice and improve quality of life.

The results are presented in tables, figures, and one appendix. The statistical analysis used is adequate. The discussion is in-depth and well systematized, comparing findings with international recommendations for CKD management. The conclusions logically follow from the obtained results.

Contributions

There are six stated contributions, grouped into theoretical and practical-applied:

Theoretical contributions:

1. Mineral and bone disorders significantly affect physical activity, emotional stability, and patients' perception of their overall health.
2. Among hemodialysis patients, functional status is markedly impaired, necessitating aerobic intradialytic exercise.
3. An original algorithm has been created for conducting intradialytic exercises to improve rehabilitation and quality of life.

Practical-applied contributions:

1. For the first time in Bulgaria, aerobic intradialytic exercises using a specialized cycle have been applied in chronic hemodialysis patients.
2. The role and impact of intradialytic aerobic exercise on emotional status and self-perceived well-being have been assessed.
3. For the first time in Bulgaria, an algorithm of care including laboratory and functional assessments for CKD-MBD patients has been developed.

Conclusion

The dissertation meets the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB) and the Regulations for the Development of the Academic Staff at MU-Varna.

All of the above provides grounds for me to give a positive assessment in favor of
awarding the educational and scientific degree "Doctor" to Magdalena Ivanova Bosheva
MD.

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