

REVIEW

Regarding the competition for the academic position of Professor in the field of higher education 7. Healthcare and sports, professional direction 7.1. Medicine, scientific specialty Nervous diseases for the needs of the Faculty of Medicine, Prof. Dr. Asen Zlatarov University, Burgas, announced in State Gazette, no. 45/17.06.2022

Candidate: **Dr. Ivan Nikolov Dimitrov, MD, PhD, DSc**

Member of the Scientific Jury: Acad. Prof. Dr. Ivan Gospodinov Milanov, MD, PhD, DSc, UMHATNP "St. Naum", Sofia, according to Order No. RD – 272/15.09.2022 of the Rector of Prof. Dr. Asen Zlatarov University, Burgas

1. Scientific research and applied scientific activity of the candidate

The submitted materials testify to the candidate's good scientific and publication activity. In the current competition, Dr. Dimitrov participates with 83 full-text publications which are subject to review. They include 1 monograph, 1 abstract of a dissertation for the scientific degree "Doctor of Sciences", 14 publications in referenced and indexed scientific journals, 61 published in non-refereed but reviewed journals, as well as 6 published chapters of collective monographs.

The peer-reviewed publications are divided into ten sections:

- I. Multiple sclerosis
- II. Cognitive impairment, dementias and neuropsychology
- III. Electroencephalography, epilepsy
- IV. Extrapyramidal diseases
- V. Neuro-oncology and neurosurgery
- VI. Cerebrovascular disease
- VII. Syndromes and clinical cases
- VIII. Occupational diseases
- IX. Quality of life
- X. Nursing.

Dr. Dimitrov is the first author of 12 (14.5%) of all submitted papers. He is the single author of 4 of them: 1 monograph, 1 author's abstract of a dissertation and 2 review articles.

I. Multiple sclerosis

Multiple sclerosis (MS) is an important topic of the candidate's scientific work. His dissertation entitled "Brain Volumetric Parameters and Cognitive Status in Relapsing-Remitting Multiple Sclerosis" and some related publications present with both theoretical and applied value. The complex nature of the study determines the presence of contributions in several directions. Dr. Dimitrov has established a complex study of brain volumetry and cognitive assessment with neuropsychological tests and evoked potentials in relapsing-remitting multiple sclerosis. Along with the immediate benefits, the approach and concept can be recommended for future studies. A personal contribution of the author is also the specialized protocol he created for systematic collection of information on the cognitive status and cerebral volumetric indices in patients with MS, together with an electronic version. The qualities of the protocol are confirmed in the process of work. Dr. Dimitrov has applied an original set of accessible neuropsychological tools he compiled to study cognitive impairment in MS patients. Another personal contribution is related to the selection and application of a set of methods and tools for volumetric processing, through which new quantitative information on characteristic MS parameters was obtained. Dr. Dimitrov's own experience in using software for volumetric analyzes of MRI data in MS provides the opportunity to expand the application of these methods in practice (83).

Dr. Dimitrov has co-authored publications addressing the comorbidities of MS. Clinical cases of patients with MS and syringomyelia (24), MS and structural epilepsy (38), and MS and Lyme disease (54) have been described. Gastroenterological (25), liver (37), and thyroid disease (35) have been studied in MS patients. The impact of MS on neuropsychological models has been analyzed (10). Original contributions appear in the publications concerning the impact of various comorbid conditions on the quality of life in MS patients (55, 63, 64).

Positron emission tomography (PET) is an established non-invasive technique for studying the basic biochemical processes and physiological functions of the CNS. In MS, (18F)-FDG PET/CT detects supra- and infratentorial areas of reduced glucose metabolism consistent with MRI lesions. Widespread hypometabolic disorders are found in the cerebral cortex and subcortical nuclei. No hypermetabolic changes are visualized in the area of active plaques. The method provides information about the main pathogenetic mechanisms and the relationship of functional brain disorders with clinical manifestations. A co-authored review article on the

application of (18F)-FDG PET in MS has contributed to the literature and to clinical practice in neurology (39).

II. Cognitive impairment, dementia and neuropsychology

The works concerning general neuropsychology and dementology continue Dr. Dimitrov's research goals of previous years. The epidemiology, diagnosis and treatment of dementias have been among the main scientific interests of the author since the beginning of his scientific activity. They have been published in review articles that contribute to this important area of dementology (36, 70).

A significant place among the works takes the monograph entitled "The Clock Drawing Test in Clinical Practice" (83). Dedicated to one of the most frequently used neuropsychological tests, it contains a comprehensive review of the literature and a description of assessment methods according to most of the scoring systems applied in practice. Evaluation criteria and strategies of varying complexity, and analysis of the results are presented. Contributions to cognitive neuroscience derive from a detailed review of literature data on the characteristics, specificity, and clinical utility of the test in its various forms and scoring methods. The presented own experience, supported by statistical analysis, also an important contribution. The candidate's work with the clock drawing test continues in the thesis of one of Dr. Dimitrov's doctoral students. The scientific work includes a study determining optimal threshold values for differentiating mild from moderate dementia with different versions of the test (61). This improves flexibility for specialists working with the test.

A contribution to neuropsychological practice is the publication considering the calculation of a total score for the CERAD neuropsychological battery (9). The application of Chandler's method for calculating a total score for a Bulgarian cohort demonstrates qualities that allow recommending its routine use.

III. Electroencephalography and epilepsy

The main contribution in this section is a co-authored handbook on clinical electroencephalography, intended for neurologists, interns, EEG-technicians, and other specialists (76-81). The handbook presents practically oriented information on the method of EEG.

In a separate publication, the changes in visual and auditory evoked potentials in patients with epilepsy are examined (16). A contribution to clinical practice is the suggestion that this method may find routine application in patients with epilepsy.

Quantitative EEG and its use in patients with autism spectrum disorders and attention deficit / hyperactivity disorder is the subject of a study presenting quantitative EEG findings (7). This is a contribution to the efforts to determine specific neurophysiological changes and to develop methods for early diagnosis and treatment.

A scientific and practical contribution is made by the article demonstrating an increase in the diagnostic value of PET/CT co-registration for the localization of epileptogenic brain lesions in patients with structural epilepsy (15).

IV. Extrapiramidal diseases

Comorbidity in patients with Parkinson's disease (PD) is the main topic of 2 articles. Type 2 diabetes mellitus (18) as a potential risk factor for PD and gastrointestinal comorbidity in PD and essential tremor (ET) have been examined (29). Another contribution to the literature is the description of olfactory disturbances in PD, with normal olfactory function in patients with ET, progressive supranuclear palsy, and corticobasal degeneration (30).

Results of a similar incidence of head trauma and a slightly greater incidence of general anesthesia in the ET group support further investigation of their potential causative role in the pathogenesis of ET (58).

Contributions to the Bulgarian literature are the published review articles on sleep disorders in PD (60) and on psychosis and hallucinations (59), with recommendations for specific treatment.

Data on increased cholesterol and triglycerides in ET could stimulate further research in this direction (6). Preliminary results from (18F)-FDG PET/CT in ET patients for possible changes in Broca's area, visual areas, and anterior cingulate cortex can be considered of importance (4). The article on the dental health of patients with PD is an example of interdisciplinary approach and contribution to the promotion and mastery of a problem that is rarely commented on in the literature (23).

V. Neuro-oncology and neurosurgery

The publications in this section are developed in collaboration with neurologists and neurosurgeons. A review article on the quality of life in patients with brain tumors (21) is a

contribution to the literature on the topic. Important publications are related to the methodology and practice of risk prevention and control in neurosurgical practice, the application of the universal neurosurgical safety checklist (19, 22), potential incidents and their detection and reporting (20).

VI. Cerebrovascular disease

The data obtained from analyzes of various parameters related to the accompanying diseases in patients with acute cerebral stroke, as well as the derived recommendations for therapeutic management, contribute to the characterization and confirmation of some risk factors and relationships (26, 27, 28, 32, 33).

VII. Syndromes and clinical cases

The case reports of keratoconus and hypertrophic spinal syphilitic meningitis manifesting as a transverse spinal cord lesion, as well as the review article on late neurosyphilis, are contributions to neurology practice (1,2,17). A useful addition to the clinical descriptions of rare syndromes is the article on Parry-Romberg syndrome (34). Of practical value is the description of a clinical case illustrating the influence of stigmatizing beliefs and prejudices of ethnic minorities on seeking mental health (8). More articles are devoted to clinical cases, including Gerstmann's syndrome (14), Huntington's disease (71), Miller Fisher's syndrome (72), Ollier's disease and its neurological complications (73), stiff man syndrome (74). Comorbidity between some common neurological diseases is highlighted, for example the rare combination of glioblastoma, multiple sclerosis and epilepsy (3) and osteoid-osteoma of the femoral head and disc herniation (5).

An interesting clinical case from pediatric neurology practice is described in co-authorship – a brain abscess in a child, with a discussion of diagnosis, differential diagnosis, the role of prompt imaging and treatment for attaining a good prognosis (62). A paper is devoted to anti-NMDAR encephalitis in a 12-year-old girl, one of the few similar descriptions in the country (11).

VIII. Occupational diseases

Useful additions to the specialized literature are the articles that describe the possible relationship between vibration exposure and amyotrophic lateral sclerosis syndrome (12), and

the chronic neurotoxicity of lead, long-term exposure to which is discussed as a risk factor for cognitive impairment in workers (13).

IX. Quality of life

An indisputable contribution to Bulgarian science and clinical practice in the field of pediatric neurology is the translation and adaptation into Bulgarian of the specialized questionnaire for quality of life, KINDL^R, carried out in co-authorship (75). The questionnaire has been published for the first time in Bulgarian and is freely available for use in the management of Bulgarian patients.

X. Nursing

This topic is related to the professional commitment of the author between 2013 and 2021 as head of department, and subsequently director of the Affiliate of the Medical university of Varna in the city of Sliven, where training of nurses and midwives, as well as doctoral students in management of nursing care takes place. The publications, developed in co-authorship with other specialists, represent current topics from the fields of nursing and midwifery care, and address socio-medical and pedagogical problems. These include the topic of pregnancy in women with epilepsy (41,42), care for patients with multiple sclerosis (46,48), the administration of the Glasgow Coma Scale by nurses (47), the risks of infection during manipulations and ways to reduce them (39, 51, 52, 68). These publications represent a contribution to the specialized literature with emphasis on certain elements of the activities of healthcare professionals that have a direct impact on the quality and outcomes of their practice. Four publications (43, 50, 56, 65) address practical issues in the care for children with diabetes mellitus. The prevention of a socially significant disease such as cervical cancer in the light of screening programs for early detection of human papillomavirus has also been considered (69). A clinical case of Waterhouse-Friderichsen syndrome shown from the perspective of nurses is presented in a separate article (66).

Studies of adolescent sexual health (44, 49), hospital nutrition (40), patient communication, awareness and satisfaction with health care (53, 57) are also described.

Publications presenting the role of practical classes in the preparation of healthcare specialists (45) and modern training methods (67) contribute to the specialized educational literature.

2. Evaluation of the candidate's pedagogical training and activity

Dr. Dimitrov graduated in medicine at the Medical University – Varna in 2002. He has a recognized specialty in Nervous diseases from 2007 and a PhD degree from 2009, with a thesis entitled "Study of dementias and mild cognitive impairment among the population of the city of Varna". Since May 2017, he has a recognized "Doctor of Sciences" degree with a dissertation on "Brain volumetric parameters and cognitive status in relapsing-remitting multiple sclerosis".

Dr. Dimitrov has attended various training courses in the country and abroad.

He has acquired professional qualifications in: Clinical Neuropsychology – Medical university - Sofia (2010), Clinical Electroencephalography – Medical university - Sofia (2011), Evoked potentials – Medical university - Sofia (2011), Ultrasound diagnostics of the nervous system – Medical university -Varna (2021), and a pedagogical qualification for trainers from medical institutions – Medical university -Varna (2014).

Since 03.2003 he has been a full-time doctoral student, since 10.2003 – assistant professor, since 11.2006 – senior assistant professor, from 02.2010 to 03.2013 – chief assistant professor in the Department of neurology of Medical university - Varna, Faculty of Medicine. From 03.2013 to 09.2015 he was associate professor, head of the Department of nursing at the Sliven Affiliate of the Medical university of Varna, and from 09.2015 to 2021 he was director of the Affiliate.

As of July 2022, he has 18 years and 8 months of work experience and 18 years of teaching experience, and has adequate academic occupation.

During his work at Medical university - Varna he was conducting lecture-based and practical training in neurology for students of medicine and dentistry in Bulgarian and English, for specialists in neurology and general medicine, practical training in neurology for students in nursing and midwifery. He was also co-leading the training of medical students within an elective course in neurobiology, and training of doctoral students.

He supervised 3 successful doctoral students, being the sole supervisor of 1 and second supervisor of 2 doctoral students.

Dr. Dimitrov is fluent in French and English and intermediate in Russian. He received a scholarship of the French Government for a three-month specialization in France in 2005, and various scholarships to attend scientific forums. He was awarded a Certificate of Appreciation by the Association of Medical Students in Bulgaria for conducting English language training for students at the Medical University - Varna.

He participated in 1 local, 3 national and 1 international project under the leadership of the University of California, Berkeley, USA: "Alzheimer's disease and other forms of dementia – prevalence and access to medical care, costs and quality of life."

According to the presented reference, Dr. Dimitrov's works have been cited 39 times in scientific publications, referenced and indexed in world-renowned databases, and 7 times in peer-reviewed papers.

Dr. Dimitrov is a member of the Union of Bulgarian physicians, Bulgarian Society of Neurology, Association of Movement Disorders and Multiple Sclerosis, Bulgarian Association of Neuro-Oncology, Union of Scientists - Varna. He is a co-founder of the Bulgarian Association of Neuro-oncology, a member of the Organizing Committee of the I-IV international meetings of BANO with training courses, Chairman of the Organizing Committee of Scientific Conferences on "Modern Trends in Healthcare", Sliven Affiliate of Medical university – Varna, held in 2016 and 2018. He is a consultant to Alzheimer's Compassion Foundation.

3. Main scientific and applied contributions

The following original contributions can be underlined:

- For the first time, a monograph is presented in Bulgarian, dealing with the different systems for evaluating the clock drawing test, with a practical part, useful for various specialists.
- The KINDL^R quality of life questionnaire in childhood has been translated and adapted into Bulgarian for the first time. It is approved for use in its final form in Bulgarian for scientific research as well as in practice for Bulgarian pediatric patients.
- For the first time, Chandler's method for calculating a total score for the CERAD neuropsychological battery was applied to a Bulgarian cohort.

There are also contributions of a scientific and applied nature:

- The handbook for training in clinical electroencephalography is a contribution to the Bulgarian educational medical literature.
- The described clinical cases represent a contribution to the Bulgarian neurological literature and clinical practice, namely:
 - "Keratoconus personality" in the field of neuro-ophthalmology;

- Hypertrophic spinal syphilitic meningitis, demonstrating important highlights of the differential diagnosis in spinal pathology;
- Parry-Romberg syndrome: clinical manifestations, pathogenesis and the role of the multidisciplinary team in the diagnosis and treatment of progressive hemifacial atrophy;
- The psychopathological dynamics of a disaster victim rejecting the offered treatment, and the importance of stigmatizing beliefs and prejudices of ethnic minorities having an impact on the ability of professionals to provide comprehensive medical care;
- Anti-NMDAR encephalitis debuting with epilepsy, the description of which in a 12-year-old girl is among the few in the country.
- The risks of infection when performing manipulations by practicing nurses and students in the specialty were examined, and strategies for their reduction were proposed.
- Some problems in patients with neurological diseases (pregnancy in epilepsy, quality of life and level of awareness in multiple sclerosis) have been identified and opportunities for healthcare professionals to be involved in solving them have been highlighted.
- The involvement of healthcare specialists with specific actions in the prevention of diabetes, obesity and reduced physical activity, and in improving the lifestyle of school-aged children is motivated.
- Emphasis is placed on the growing problem of sexual health in adolescence, highlighting the need for timely education with the participation of healthcare professionals.
- Guidelines are proposed to overcome some shortcomings of the communication with the patient, leading to insufficient information regarding the treatment process and to dissatisfaction with in-hospital care.

The significance of the mentioned contributions to neurological science and practice is confirmed by the published data in international and Bulgarian periodicals, by the qualities of the presented monograph and handbook, by the relevance of the developed topics in the various

fields. The above-listed contributions are indisputable and fully meet the requirements for the academic position of "professor".

4. Evaluation of the diagnostic and therapeutic activity

From October 2003 to 2021, Dr. Dimitrov worked at the First Clinic for Nervous Diseases, UMHAT "St. Marina" - Varna as a physician, where he also participated in committees for treatment of neurological diseases under the programs of the National Health Insurance Fund. Since the beginning of 2022, he has been Head of the Nervous Diseases Ward of "Heart and Brain" hospital – Burgas. Proof of the quality of Dr. Dimitrov's diagnostic and therapeutic work is the level of development of the clinical aspects in his scientific output, the respect he has among his colleagues, his participation in the development of research projects, and his membership in scientific societies.

5. Scientometrics

According to the submitted documents, Dr. Ivan Dimitrov fully meets the mandatory conditions, quantitative criteria and scientometric scores according to the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for its application, and the Regulations for the development of the academic staff at Prof. Asen Zlatarov University – Burgas, concerning the Academic position of "Professor". The candidate exactly fulfills the criteria of groups A and B, and exceeds those of D, E and F. Thus he collects a total of 1673.29 points, while the minimum required is 670.

In conclusion, bearing in mind all of the above, I consider it reasonable to propose Dr. Ivan Nikolov Dimitrov to occupy the academic position of Professor in the field of higher education 7. Healthcare and sports, professional direction 7.1. Medicine, scientific specialty Nervous diseases, for the needs of the Faculty of Medicine, Prof. Dr. Asen Zlatarov University, Burgas.

Sofia

24.10.2022

Reviewer:

/Acad. Prof. Dr. Ivan Gospodinov Mi'