OPINION

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Opinion of the PhD thesis for awarding educational and scientific degree " PhD" in Medicine in the field of higher education 7. "Health and Sport", professional field 7.1. "Medicine", scientific specialty "Physiotherapy, Resort and Rehabilitation" of **MD Yassen Todorov Petrov**, PhD student at the Department of Physiotherapy, Rehabilitation and Thalassotherapy, Faculty of Public Health, Medical University "Prof. Dr. Paraskev Stoyanov" - Varna.

Form of doctoral studies: full-time

Theme: "A comparative study of the effects of Deep Oscillation /DEEP OSCILLATION/ and physical therapy modalities in patients with cervical spondylosis"

Scientific counselor: Assoc. Prof. MD Mariana Mihaylova Krusteva-Ruseva, PhD

Grounds of Opinion: According to the **Order of the Rector No. R-109-165/09.05.2024** of the Medical University "Prof. Dr. Paraskev Stoyanov"- Varna I am hereby appointed as an external member of the Scientific Jury and official reviewer of the dissertation of MD Yassen Todorov Petrov.

This opinion has been developed and submitted in accordance with the requirements of the Academic Staff Development Act in the Republic of Bulgaria, the Rules for the Implementation of the Academic Staff Development Act and the Rules for the Development of Academic Staff at the Medical University /MU/-Varna.

Curriculum vitae and professional qualifications of the applicant

Dr. Yassen Todorov Petrov was born in 1994. In 2013 he graduated from the Mathematical High School "Dr. Petar Beron". In 2019 he graduated from the Medical University of Varna with a Master's degree in medicine. Since 2019 he has been working as a physician at the Medical Center for Rehabilitation and Sports Medicine in Varna as well as at the Center for Emergency Medical Care, Varna. In 2020 he started working as a physician and assistant at the University Hospital "St. Marina" Varna EAD and Department of Physiotherapy, Rehabilitation

and Thalassotherapy, Faculty of Public Health, Medical University "Prof. Dr. Paraskev Stoyanov" - Varna. She has completed a number of qualification courses in the specialty, such as: "Goniometry", "Manual Muscle Testing", "Introduction to Aromatherapy", course in "Orthopedic Medicine"- Cyriax, "Innovative Educational Technologies", etc.

Relevance and importance of the topic

The PhD thesis of Dr. Yassen Todorov Petrov addresses a topical issue related to the possibilities of certain physical factors, including Deep Oscillation therapy in the spine disease treatment and in particular - cervical osteochondrosis. The relevance and the significance of the problem are related to the quality-of-life disruption and the psycho-emotional state of the patients affected by the disease. As the disease progresses, the function of the cervical spine is impaired, with symptomatology accompanied by characteristic pain sensitivity and active range of motion limitations in the affected spinal segment. These factors cause reduced work capacity, increased permanent incapacitation (disability) and represent a financial burden for patients and society.

Despite the significant number of studies demonstrating the positive impact of the available physical factors used in routine practice, the process of searching for new more accessible therapeutic approaches with better therapeutic efficacy and fewer side effects needs to continue.

The aim is formulated explicitly as to study the effect of the combined application of Deep Oscillation and some physical factors and to compare it with a combination of routine physical factors applied to treat patients with cervical osteochondrosis. The doctoral dissertation has eight tasks. They are formulated correctly and correspond to the purpose of the study.

Structure of the thesis

The PhD thesis of Dr. Yassen Todorov Petrov is presented in 205 standard pages and contains the following sections: literature review, aim, objectives and hypotheses, materials and methods, results, discussion, conclusion, findings, contributions, publications related to the thesis, bibliography and appendixes. The dissertation contains 47 tables and is illustrated with 68 figures.

The scientific work is structured in accordance with the requirements specified in the Rules for the Development of the Academic Staff of MU-Varna. Each of the parts of the

dissertation follows the logic of the set tasks and aim, and the conclusions naturally result from the own findings, statistical processing of the data and discussions.

Literary awareness of the PhD student

The dissertation contains a literature review set out in 69 pages. In this section, the author thoroughly discusses the anatomical structures that are directly affected by the pathological process, the disturbances in spinal function and the symptomatology caused by the degenerative changes. Etiological factors and the course of the disease are discussed. Data about the most commonly applied diagnostic modalities and studies demonstrating the effectiveness of prophylactic and therapeutic factors applied in routine medical practice are presented. Emphasis is placed on the problem of increasing morbidity and the need to develop new therapeutic approaches with better effectiveness leading to improvement in the psycho-emotional state and quality of life in people affected by cervical osteochondrosis.

The conclusions from the literature review are specific and directly related to the aim and objectives of the study.

Survey methodology and design

The study included 121 patients who met the defined criteria and were diagnosed by imaging - radiological examination. According to the study design (prospective, parallel, single-blind study), patients were divided into three groups: group "A" (Deep Oscillation Therapy, TENS and kinesitherapy); group "B" (Phonophoresis with NSAIDs, TENS and kinesitherapy) and a third group "C" (Placebo-Deep Oscillation, TENS and kinesitherapy). Allocation of patients to the groups was made in order of presentation for examination. For the purpose of the study, static and dynamic pain was assessed using the visual analog scale, muscle tone using a specially developed three-grade scale, cervical spine range of motion using goniometry, Zung's test to objectify psycho-emotional state, and quality of life using the modified Neck Disability Index questionnaire. The assessment scales used in this dissertation have significant practical value and are easy to complete, process, and analyze. The doctoral student has selected appropriate statistical methods that provide a comprehensive and reliable assessment of the data, according to the purpose of the study presented.

The findings meet the set objectives. The dissertant has summarized and illustrated well the results obtained with tables and figures, the distribution of patients in the three groups and the results achieved. The obtained results of the study show that complex therapy including Deep Oscillation of patients with cervical osteochondrosis leads to reduction of clinical manifestations, to improvement of motor abilities, positively influences psycho-emotional state and quality of life of the examined persons.

The discussion of the thesis topic is well structured and based on the obtained results, which emphasizes their significance. The dissertation analyzes and compares the obtained results with other studies in the world literature. The most important results of the study are summarized in the conclusion.

There is a logical correspondence between the stated aim, the results obtained, the discussion and the conclusions drawn. The actual results and discussion are presented in 75 pages and are richly illustrated. They follow the course of the set objectives and are presented in detail. The data presented shows the thorough and detailed analysis that the dissertant made when examining the patients, which gives credence to the conclusions drawn.

Contributions and Relevance of the Study for Practice

From the developed topic in the Dissertation 9 conclusions have been formulated and 6 contributions have been derived (four theoretical-methodological and two practical-applied contributions).

In the PhD thesis of Dr. Yassen Todorov Petrov, the first national study on the effect of the combined application of low-frequency alternating electrostatic field (Deep Oscillation) with physical factors from routine practice in patients with cervical osteochondrosis was conducted.

As a result of the study, a comprehensive physiotherapy program including Deep Oscillation in the treatment of cervical osteochondrosis was developed.

Abstract and publications

There are 3 full-text publications related to the topic of the thesis, which have been published in two national and one foreign journal. The publications comply with the requirements of the Academic Staff Development Act in the Republic of Bulgaria and the internal regulations of the Medical University of Varna.

The abstract is structured in accordance with the requirements of the regulations. Its content corresponds to the dissertation, 46 tables and 62 figures are presented to illustrate the results obtained from the research.

Conclusions

The presented PhD thesis by **MD Yassen Todorov Petrov "Comparative Study of the Effects of Deep Oscillation and Some Reformulated Physical Factors in Patients with Cervical Osteochondrosis"** is methodologically well-founded, with a clearly formulated aim and objectives, well-justified conclusions and an actual contribution to science.

The submitted materials comply with all the requirements of the Law for the Development of Academic Staff of the Republic of Bulgaria (LADRB), the Regulations for the Implementation of the LADRB and the Regulations of MU-Varna.

On the basis of the above statement, I hereby confidently give my **positive assessment** of the conducted research and suggest the Honorable Scientific Jury to award the degree of PhD to Dr. Yassen Todorov Petrov in the scientific specialty of Physiotherapy, Resort and Rehabilitation.

Date: 21.06.2024
Stara Zagora

Signature..
(Assoc. Prof. MD Galina Petrova Mratskova - Delieva, PhD)