

## **Review**

**By Assoc. Prof. Mariana Mihaylova Krasteva-Ruseva, MD, PhD,  
Head of the Department of Physiotherapy, Rehabilitation and  
Thalassotherapy  
Medical University - Varna**

Of the thesis for awarding for educational and scientific degree “Doctor of Medicine” in the field of higher education 7. Health and sport, professional field 7.1 Medicine, scientific discipline Physiotherapy, Thalassotherapy and Rehabilitation.

**Author:** Tsvetomir Yankov Yankov, MD

**Form of doctoral studies:** full time PhD student at Medical University Varna.

**Topic:** “Study on the combined use of high-energy laser and manual therapy in patients with functional thoracic spine disorders”

**Thesis supervisor:** Assoc. Prof. Dr Iliya Todorov Todorov, MD.

### **Award procedure**

According to the Order № P-109-639/ 21.12.2023 by the Rector of the Medical University "Prof. dr. Paraskev Stoyanov" - Varna and on the basis of Protocol №1/03.01.2024, I am appointed as a member of the Scientific Jury and official reviewer of the dissertation of Dr. - Tsvetomir Yankov Yankov, PhD student in full-time form of study at Medical University - Varna.

The review was developed and presented in accordance with the requirements of the Law on the Development of the Academic Staff of the Republic of Bulgaria /LDASRB/, the Regulations for the Implementation of the LDASRB and the Regulations on the Development of the Academic Staff at the Medical University – Varna.

The submitted documents on paper and electronic media are in accordance with the Procedure for Acquisition of the PhD degree at MU-Varna, the Regulations of MU Varna and include the following documents:

- CV in European format with the PhD student signature
- Enrolment and Disenrollment Orders with Right of Defense
- Dissertation
- Abstract
- Copies of scientific publications related with dissertation
- Other documents related to the procedure

### **Biographical Data**

Dr. Tsvetomir Yankov Yankov was born on 25.05.1989 in Veliko Tarnovo. He completed his secondary education in 2008 at the "Vasil Drumev" High School of Mathematics and Nature Science V. Tarnovo. In 2014 he completed his higher education in medicine with a Master's degree at the Medical University Varna. In 2020 he acquires a specialty in Physical and Rehabilitation Medicine.

His professional medical career began in 2014 at the centre for emergency medicine in the city of Dolni Chiflik. In 2016 Dr. Tsvetomir Yankov was appointed as a resident at the Clinic of Physical and Rehabilitation Medicine at the University Hospital "St. Marina" Varna EAD. Since 2020 he holds the position of assistant at the Department of Physiotherapy, Rehabilitation, Talasotherapy and Occupational Diseases at Medical University Varna. He leads practical seminars for Bulgarian and English-speaking medical students, rehabilitation therapists, midwives and nurses. Dr. Tsvetomir Yankov Yankov has participated in a number of qualification courses for postgraduate training: laser therapy, Cyriax orthopedic medicine, manual therapy and PNF.

Dr. Tsvetomir Yankov Yankov is a member of the Bulgarian Medical Association, the Association of Physical and Rehabilitation Medicine and the Bulgarian Society of Manual Medicine.

Dr. Tsvetomir Yankov Yankov is fluent in written and spoken English and Russian.

He has high professional competence, collegiality and tolerance, good communication skills and teamwork abilities.

### **Characteristics of the thesis**

The dissertation submitted for review is organized in 11 adequately correlated sections and complies with the requirements specified in the Regulations for the Development of the Academic Staff of MU-Varna. It is developed in 143 standard pages, structured according to the requirements - with introduction /4 p./, literature review /40 p./, aim, objectives, hypotheses /2 p./, materials and methods /11 p./, own results /37 p./, illustrated with 42 figures and 24 tables, discussion /9 p./, conclusions /1 p./, inferences /1 p./, contributions /1 p./, publications related to the dissertation /1 p./. There are 16 appendices /9 pages/ of the questionnaires used, pain scales, therapeutic methods and protocols for monitoring the effect of treatment, bibliography /12 pages/ containing 166 literature sources, of which 18 in Cyrillic and 140 in Latin.

### **Significance and relevance of the topic**

The topic of the dissertation is significantly relevant for our time. Scientific studies present back pain as one of the most common reasons why people need medical treatment worldwide. Functional thoracic spine disorders are a common condition among people of active age that is a cause of back pain. Correct diagnosis and formulation of an adequate treatment plan without unnecessary burden of medications requires a complex approach, both to determine the origin of the problem and to build a strategy to eliminate its causes and consequences. Therefore, the search for a workable solution for the treatment and prevention of functional thoracic spine disorders is of considerable interest to both medical science and medical practice.

### **Evaluation of the dissertation**

The literature review impresses with its thorough and informative analysis of the available literature. The presentation is characterized by logical consistency, conciseness and sufficient specificity in the presentation of the published foreign and Bulgarian experience on the problems of impaired function of the intervertebral joints in the thoracic spine segments. It should be noted that about 40% of the citations are from the last ten years, 10% of which are from the last five years. The etiopathogenesis of the condition, specific features of biomechanics and pathophysiology of functional disorders in the thoracic spine, as well as the possibilities of the applied physical factors for treatment are thoroughly discussed. On the basis



of the conclusions drawn, a clearly defined **aim** of the thesis was set: to study the effect of the combined application of high-energy laser and manual therapy in patients with functional disorders in the thoracic spine.

The aim is clearly formulated and fully corresponds to the current scientific research in this field. There are 5 specific and realistic **tasks**, which are well defined and adequate to solve the objective. Three working **hypotheses** related to the set objective are formulated.

**The Materials and Methods** section describes the contingent selected according to criteria relevant to the scientific study and the medical requirements of the condition, the methods, and the organization of the scientific study. A total of 82 individuals included in the study ranged in age from 18 to 50 years with proven functional disorders in the thoracic spine. Diagnosis was confirmed by medical doctor with a specialty in physical and rehabilitation medicine and additional training in manual therapy, based on clinical manifestations of nonspecific pain and limited back motion and physical examination using manual diagnostic methods. Participants were screened at baseline before treatment initiation, after completion of the treatment course, and on day 45 after initiation of therapy, using a complex of methods: medical history, specific manual diagnostic tests, functional status, Ott's test - to examine mobility in the thoracic spine for flexion and extension, goniometry for rotational movements in the thoracic spine in both directions with an inclinometer, measured in degrees, assessment of spontaneous and palpatory pain using the VAS (visual-analogue scale), the McGill questionnaire (SF-MPQ) to report pain quality and intensity, and the Functional Rating Index to quantify subjective perception of limitation in the performance of activities of daily living in musculoskeletal spine disorders.

Statistical processing of the data was done thoroughly and accurately using IBM SPSS Statistics for MAC v. 29.0.1.0(171) software, and graphical representation was done using Microsoft Excel for Mac Version 16.69.1, 2019. Alternative, variance, correlation, parametric and graphical analyses were used, with the significance level of the null hypothesis estimated at  $p < 0.05$ .

During the study, a large number of results were obtained and successfully analyzed, systematized and illustrated with appropriate tables and figures. In the discussion of the dissertation, the author's own results are summarized and compared with data cited from the contemporary medical literature. The majority of patients were in the age range 30-39 years. All patients pursued occupational activities and hobbies associated with physical overexertion,

twisting postures, abrupt lifting of loads, prolonged stay in a sitting position, and the practice of professional sports. The ratio between men and women is in favor of the female gender. The data presented show a statistically significant improvement in the condition of the patients in both groups in terms of the signs monitored, both after the end of treatment and in the long term at day 45. A statistically significant better effect was achieved from the application of the complex program including a high-energy laser compared to the manual therapy group alone. The comparison of the results between the two groups provides the author a reason to recommend the application of the developed complex program for the treatment of patients with functional thoracic spine disorders. The dissertation concludes with 6 specific, well-articulated inferences, and 4 theoretical-methodological and 3 practical-applied contributions. The most important results of the study are summarized in the conclusion.

The abstract is structured in accordance with the requirements, its content corresponds to the dissertation, 42 of the most demonstrative figures and 24 tables are presented to illustrate the results obtained from the research.

There are 3 publications related to the dissertation, in which the dissertant is the first author. The articles published in full text in connection with the dissertation fully meet the quantitative criteria specified in the Law on Publications and the internal regulations of MU-Varna for the publication activity of the PhD student. The study was approved by the Research Ethics Committee of MU-Varna.

The dissertation was discussed and referred for defense at the Departmental Council of the Department of Physiotherapy, Rehabilitation and Thalassotherapy, held on 11.12.2023.

### **Evaluation of contributions**

The contributions are logically formulated in two groups: of a scientific and practical nature. For the first time in the country, a comparative study of the effects of manual therapy as monotherapy and its combined application with a high-energy laser in patients with functional disorders in the thoracic spine was conducted. The short- and long-term therapeutic effectiveness of manual therapy in patients with functional thoracic spine disorders has been demonstrated. The short- and long-term therapeutic efficacy of the combined application of manual therapy and high-energy MLS laser in patients with functional disorders in the thoracic region has been demonstrated. The superiority of the combined application of manual therapy



and high-energy MLS laser in patients with somatic dysfunction in the thoracic spine over monotherapy with manual therapy was demonstrated with respect to half of the monitored indicators.

### **Conclusion**

The developed dissertation of Dr. Tsvetomir Yankov Yankov "Study of the combined application of high-energy laser and manual therapy in patients with functional thoracic spine disorders" is relevant and significant. The study is very well organized and executed. The dissertation demonstrates remarkable capabilities in combining competent knowledge and skills with an appropriate set of methods. The dissertation contains original and confirmatory scientific-theoretical and scientific-applied contributions, so that it meets all the requirements of the Law for the Development of Academic Staff in the Republic of Bulgaria /LDASRB/ and the relevant Regulations of MU-Varna.

Due to the above, I confidently give my positive assessment of the presented dissertation and propose the members of the Scientific Jury to vote positively for the award of the educational and scientific degree of "Doctor" to Dr. Tsvetomir Yankov Yankov in the Doctoral Program in Physiotherapy, Resort Medicine and Rehabilitation.

31.01.2024

Prepared the review:

Заличено на основание чл. 5,  
§1, б. „В“ от Регламент (ЕС)  
2016/679

/Assoc. Prof. Mariana Mihaylova Krasteva-Ruseva, MD, PhD/