REVIEW

From Prof. Galina Stamova Tchaneva, PhD

FPH "Prof. Dr. Tz. Vodenicharov, MD" of the Sofia University

Appointed as a member of the Scientific Jury by Order No. R-109-149 of 26.03.2026 of the Rector of the Medical University

"Prof. Dr. Paraskev Stoyanov" Varna

Subject: Procedure for obtaining the educational and scientific degree "Doctor" with a candidate - Denislav Krasimirov Ivanov - doctoral student in an independent form of study in the doctoral program "Health Care Management" in the professional direction 7.4. Public Health, with the topic of the dissertation: Application of medical dry needling in subacromial impingement syndrome in the shoulder joint, with scientific supervisor Assoc. Prof. Silviya Ivanova Filkova, PhD

In connection with the procedure, the following documents are submitted:
- Dissertation
- Abstract – in Bulgarian and English language
- Declarations of originality, for the reliability of the presented data
- List of scientific publications
- CV, copy of protocols and diplomas

The submitted documents on paper and electronic media are in accordance with the procedure for acquiring the ESD "Doctor" and the Regulations for the Development of the Academic Staff of MU "Prof. Dr. Paraskev Stoyanov" – Varna.

Brief biographical data of the doctoral student

Denislav Ivanov presents diplomas for the following education and professional development:
- 2015 – ECD "Bachelor" in Sport and Exercise Science from Edinburg Napier University, Edinburgh, Scotland
- 2020 – ECD "Professional bachelor" in Rehabilitation from the Medical College of MU "Prof. Dr. Paraskev Stoyanov" – Varna
- 2022 – ECD "Master" from the National Sports Academy – Sofia, in Physical Therapy and Rehabilitation

- 2024 – enrolled for the ESD "Doctor" at the Department of Health Care of the Sliven Branch of MU-Varna.
- 2021 – specialization in the Dry Needle Method
- 2023 – specialization in Acupuncture and Moxa at the Bulgarian Association of Physiotherapists and Acupuncture Specialists.

Denislav Ivanov's professional career began as a sports coach at the Links United football club in Edinburgh, Scotland. Since 2020, he has been working as a rehabilitator at Tervel Medical Center EOOD - Tervel, and since 2023, he has been a rehabilitator at the Dobrich Physio Center EOOD in Dobrich.

Relevance of the dissertation

Impairments in the biomechanics of the shoulder complex and changes in the scapulohumeral rhythm contribute to the chronicity of symptoms and hinder effective treatment. Within the framework of modern rehabilitation practice, methods aimed at restoring musculoskeletal balance, reducing pain and optimizing biomechanical function acquire leading importance. By integrating clinical, instrumental and functional indices, the study provides a multifaceted analytical approach that supports the formulation of objective scientific conclusions regarding the role of the medical dry needling method in the treatment of subacromial incidents.

Structure of the dissertation:

The dissertation is structured in four chapters: Chapter One – Overview; Chapter Two – Aim, Objectives and Methods; Chapter Three – Results and Discussion; Chapter Four – Own Algorithm for Physiotherapy Treatment of Subacromial Impingement Syndrome, Including the Dry Needling Method; Conclusions, Contributions, Recommendations, Bibliography and Applications.

The volume of the dissertation includes 218 standard pages, with the results being clearly presented in 20 figures, 48 tables and 6 applications. The literature used includes 202 titles, of which 4 are in Cyrillic and 198 in Latin.

The review presents the medico-social significance and frequency of distribution of subacromial impingement syndrome. The doctoral student characterizes the essence, mechanism of occurrence and mechanism of

damage in this condition. The methods of diagnosis and treatment are described in detail and in depth. Special attention is paid to the dry needling method based on a significant amount of scientific literature. The mechanism of action and the physiological effects of applying the acupuncture technique are characterized. Modern trends in the treatment of subacromial impingement syndrome emphasize the need for complex biomechanical information and a patient-centered approach, with emphasis on active recovery and long-term functional improvement. The application of medical dry needling shows promising results for pain reduction, inactivation of trigger points and improvement of functional capacity, combined with active kinesitherapy.

The literature review cites contemporary sources of scientific information.

The aim and objectives of the dissertation are clearly and specifically formulated, corresponding to the topic chosen by the doctoral student and are aimed at studying the effect of applying the therapeutic modality of medical dry needling, as a supplement to the traditional physiotherapy protocol.

Seven tasks have been defined for implementation, and in addition to the analysis of contemporary scientific sources on the topic, an appropriate toolkit has been created for assessing the clinical condition and functional status of the patient. A separate task has been formulated to develop an experimental treatment protocol. It is planned to carry out a prospective, randomized, control study with two parallel groups of patients, as well as to monitor the dynamics and durability of the result in the short and long term.

The focus of the three hypotheses is as follows: hypothesis 1 – effect on muscle strength; hypothesis 2 – effect on pain; hypothesis 3 – effect on functional outcome.

The study design formulated the subject and object of the study, as well as inclusion and exclusion criteria. Two groups were formed to conduct the parallel-group clinical trial: an experimental group, which was applied a traditional physiotherapy program and medical dry needling; a control group, which was applied only a traditional physiotherapy program. The two groups included an equal number of patients – 40. The results were monitored in four stages: 1- before the start of the intervention; 2- after 3 weeks; 3 – eight weeks after the end of the program and 4- six months after the end of the program.

The study was implemented by a doctoral student, who is a qualified therapist, in the rehabilitation center "Dobrich Physio Center" – Dobrich, which has the necessary equipment for physiotherapy practice.

The following methodological tools were used for assessment: demographic data; clinical diagnostic tests; measurement of muscle strength, range of motion, pain and functional capacity. A statistical analysis of the data collected from the study was performed.

The results are presented visually and analytically in the third chapter. Demographic data show that this problem is most often observed in the age of 40 to 50 years, in both men and women, with the right dominant upper limb being affected.

The data from both groups - experimental and control, as well as comparative statistics were analyzed on the basis of the following tests:

-provocative and diagnostic tests for subacromial impingement syndrome

-tests for range of motion and mobility

-assessment of muscle strength in the shoulder joint

-dynamics of the pain syndrome according to a visual analogue scale

-functional scales

In the fourth chapter "Own algorithm for physiotherapy treatment of subacromial impingement syndrome, including medical dry needling", a critical analysis of the existing therapeutic approach to subacromial impingement syndrome is presented. The doctoral student proves the need for structured, phase-oriented and biomechanically justified therapy. The conceptual framework of the author's therapeutic algorithm, its structure and logic, the elements of the author's therapeutic algorithm, as well as the strengths and weaknesses of the model are described.

Despite individual limitations, the assessment model demonstrates high diagnostic and clinical value, providing a reliable measurement of the effects of therapeutic interventions on muscle strength, mobility and functionality. The proposed assessment system can be considered methodologically balanced and clinically justified.

The dissertation uses a scientific style and language to reveal the problems in assessing the needs for expanding the methodology of

physiotherapy procedures in the rehabilitation of subacromial impingement syndrome of the upper limb.

The conclusions are analytically and logically derived from the conducted study and are structured on the basis of the test periods and groups:

-conclusions from the beginning of the study

-conclusions after the end of treatment

-conclusions after the eighth week of treatment

-conclusions from the long-term follow-up

-conclusions for all time periods of treatment

-conclusions consistent with the objectives of the study and the formulated hypotheses.

Contributions of the dissertation:

The contributions of the dissertation are of a scientific and scientifically applied nature:

- The theoretical model of subacromial impingement syndrome has been expanded through the analysis of biomechanical forces, muscle imbalance, scapulohumeral discoordination and the role of myofascial trigger points.

- The conceptual framework of the "medical dry needling" method has been substantiated as a neurophysiological and biomechanically determined intervention in the rehabilitation model of subacromial impingement syndrome.

- The modern scientific knowledge regarding the clinic, functions and medico-social significance of subacromial impingement syndrome has been systematized and analyzed.

- An original structured algorithm has been developed and clinically tested in patients with subacromial impingement syndrome, which includes needling with medical dry needling and traditional physiotherapeutic means.

- A functional assessment has been introduced, including combined clinical indices, which increases objectivity and diagnostic accuracy, as well as the traceability of the therapeutic effect.

- For the first time in a national context, the statistical and clinically significant superiority of the combined /physiotherapy combined with the dry needling method/ over standard physiotherapy in subacromial impingement syndrome has been proven.

- Through medium-term and long-term follow-up, the stability of the therapeutic effect of the developed algorithm has been proven.

The recommendations are aimed at practicing specialists and at Medical Universities, where rehabilitators are trained. Specialists need to have access to quality postgraduate training for practicing the algorithm in subacromial impingement syndrome, and universities need to enrich theoretical and practical training with the developed methodology.

In Application 1, detailed operational descriptions of the dry needling technique are provided.

In Application 2, the use of tests for assessing the condition in subacromial impingement syndrome is shown through photographs.

In Application 3, a visual /photograph/ implementation of techniques from the medical dry needling protocol is presented.

In Application 4 – Use of the Acheawey fascial manipulation apparatus

In Application 5 – Kinesiotherapy techniques are presented – photographs

In Application 6, a document for registering and storing data from the functional tests performed is presented.

The abstract of the dissertation includes the main elements of the research conducted.

The doctoral student presents 2 publications related to the topic of the dissertation.

Conclusion

In conclusion, I believe that the dissertation on the topic: "Application of medical dry needling in subacromial impingement syndrome in the shoulder joint" fully meets the requirements of the Regulations for the development of the academic staff of MU - Varna, therefore I give a positive assessment and propose to the members of the scientific jury to make a decision to award the educational and scientific degree "doctor" to Denislav Krasimirov Ivanov in the professional field 7.4. Public health and scientific specialty "Healthcare Management".

Reviewer:

15.04.2026

Prof. G. Chaneva, PhD