

Doctoral thesis review

PhD. Candidate: Mgr. Ivana Vlačilova

Title of PhD thesis:

Kinematic of Cervical Thoracic Spine in the Context of Whole Body Posture

Kinematika cervikothorakalnihog regionu patere v kontekstu celkoveho drženi tela

Reviewer/oponent: Doc. PhDr. David Ravnik, Ph.D. M.Sc. PT. Eur. Erg.

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Overall Comments:

The thesis presented by Mrs. Vlačilova represents excellent theoretical and practical work (supported also with adequate personal publications) about cervico-thoracic spine kinematics and the development of a new diagnostic tool or therapy for forward head posture.

The title is clear and defines the subject of the proposed thesis. Style of the study is very well arranged. The form of the thesis is illustrative. The thesis has 147 pages including literature and attachments, such as ethical commission approval (page 111) and published articles by the author of the thesis as a leading author (pages 117-138). A list of referred literature is extensive (178 publications) and well chosen.

The dissertation is divided into the following parts: formal pages, introduction, aims, hypothesis and methodology of the thesis, theoretical part, experimental part, and is concluded with a discussion and further recommendations.

The main aims of the work were to develop an objective model to assess trunk posture and to quantify the segmental spine movements in the cervicothoracic region. To prove the external rotation and adduction of the upper arm cause translation movements in cervicothoracic region and to identify if changes in cervicothoracic spine position can be predictor of body posture change after external rotation and abduction in upper arm. The partial aim was also to prove that basic move could also influence other parts of the body, such as the pelvis, thorax and scapulas, and to find out the possible therapeutic outcome of basic move and use as a diagnostic criteria in determining body posture quality.

The candidate assumes 4 hypotheses:

- External rotation and adduction of the upper arm cause straightening of the spine and trunk as a whole
- External rotation and adduction of the upper arm cause straightening of cervicothoracic region
- During the straightening of the cervicothoracic region the position of the pelvis will appear
- During the straightening of the cervicothoracic region the position of the thorax will appear

The theoretical part is well structured, includes a comprehensive range of colour pictures detailing an anatomical and biomechanical approach, both in regard to the shoulders, thorax and cervicothoracic spine and their anatomical structures. Maybe I might suggest better quality of some pictures.

Chapter 4.1.3. is not well explained. The procedure of instructions is unclear, also which data were used... because some of them did movement two times, another 10 times? I do not understand the purpose of the mentioned equalisations on page 86.

I believe the part of the study which deals with measurement is not handled with sufficient accuracy. For the cervicothoracic section the elimination of the pelvis should be done, performing tests during sitting.

Are you sure that data concerning the examination of 25 cases is large enough to draw any conclusions? What about assessing the test-retest validity of your paradigm?

I barely understand chapter 4.3. Why the T-test was performed only in the group of physiological response? I miss the control session – another movement with hands... to compare if your suggested movement is correct... for example retroflexion alone, or only order »straight your body«, or one side movement... What about the dominant arm... could this have any influence?

It is obvious that the candidate is familiar with the field of physiotherapy. In “Discussion”, the candidate mentions that he wants to incorporate the results into present scientific knowledge in this field. He would like to emphasize the clinical use of the study for physicians and physiotherapists.

Conclusion of the reviewer/opponent:

1. According to the reviewer opinion the thesis title is appropriate.
2. The abstract accurately reflects the content.
3. The purpose of the thesis is stated clearly both in the introduction and method section of the article.
4. The purported significance of the thesis is explicitly stated and adequately explained.
5. The theoretical and experimental part adequately ties to the relevant literature.
6. The experimental study methods and approach are in some points explained inadequately.
7. All tables, pictures and figures are necessary, but some pictures might require better quality/contrast.
8. The conclusions are accurate and supported by the content.

There are some minor grammatical, typographical and formatting errors, but overall they do not influence on the quality of the proposed work.

Reviewer Recommendation:

I recommend defence of the thesis and to grant a title of »doctor - PhD.« after successful thesis defence.

Dr. David Ravnik, Eur.Erg. MSPT. PhDr.