



## Letter to the Editor

**Response to letter to the editor: Effectiveness of movement control exercise on patients with non-specific low back pain and movement control impairment: A systematic review and meta-analysis 2018**


We are pleased to have the opportunity to respond to the letter to the editor from Prof. Raghava regarding our recent publication (Luomajoki et al., 2018). We will attempt to address the issues raised in this letter. Our study assessed the effectiveness of movement control exercise on patients with non-specific low back pain and movement control impairment (Luomajoki et al., 2018). As stated by Prof. Raghava, we have determined very low to moderate quality evidence, suggestive of a positive effect of movement control exercises on disability and pain severity in nonspecific low back pain. Furthermore, we conducted a separate meta-analysis according to the restriction applied on the study population, to separate studies that restricted their samples to patients showing movement control impairments as a biophysical feature from studies that included a more general nonspecific low back pain sample.

One concern expressed by Prof. Raghava was that we allotted the study conducted by Henry and colleagues into the non-restricted group although a part of their sample received targeted treatment for a movement system impairment or stabilization (Henry et al., 2014). The allocation to this targeted treatment occurred after the inclusion of a study subject and movement control impairments where therefore not an inclusion criteria to enter the study. Therefore the study by Henry and colleagues did not fulfil our a prior defined criteria for a study that restricted their sample to patients showing movement control impairments as a biophysical feature. Furthermore, we could not assume that the treatment based classification ineligible group would automatically be movement system impairment (MSI) eligible and there was no comparison between MSI eligible and MSI ineligible.

A second concern stated by Prof. Raghava was that we categorized the study conducted by Salamat and colleagues into the restricted sample group (Salamat et al., 2017). This study restricted their sample to patients with an active extension movement control impairment,

determined according to O'Sullivan (O'Sullivan, 2005). While Prof. Raghava rightly points out that this is a restriction to a sample with one direction specific movement control impairment it is nonetheless a restricted sample according to the definition used in our study (Luomajoki et al., 2018). Patients with an active extension movement control impairment show greater activity of their trunk muscles and respond well to relaxation and breathing exercises. Consequently, the main outcome measure in this pilot study was muscular activity (Salamat et al., 2017), however, also disability was measured and this was an outcome of interest in our meta-analyses.

Based on the preceding arguments, we are still certain about the appropriate use of our study apportionment and the validity of our conclusion.

## References

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