



CORRESPONDENCE

## Letter to the Editor: “Is body-weight-supported treadmill training or robotic-assisted gait training superior to overground gait training and other forms of physiotherapy in people with spinal cord injury? A systematic review”

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We read with great interest the systematic review by Mehrholz et al. We consider it as a comprehensive and innovative systematic review and meta-analysis, but we have a question about the data processing. By checking the data between the systematic review and included original studies, we found Mehrholz et al. [1] analyzed post-treatment outcomes rather than the difference between pre-treatment and post-treatment, which is at risk of generating an unreliable result. Not only when between-studies baselines are similar, but also when between-groups baselines are not significantly different, we can directly analyze post-treatment outcomes, and generate a stable result.

Considering the included studies' district, enrollment criteria, and so on, we observed huge heterogeneity of baseline among partial studies. For instance, in Kapadia [2], subjects were of American Spinal Cord Injury Association Impairment Scale (AIS) C or D grade, while subjects in Sadeghi [3] were of AIS B and C grade.

Furthermore, we found a huge diversity of baseline between the intervention and control groups in Kapadia [2] and Sadeghi [3]. In Kapadia [2], in the 6-min walk test, subjects achieved  $187.9 \pm 123.4$  m in the BWSTT plus FES group, while they achieved  $79.4 \pm 83.9$  m in the group performing resistance and aerobic training. Meanwhile, in Sadeghi [3], the capacity of 6MWT is  $340.00 \pm 89.70$  m in the BWSTT group, but  $685.71 \pm 176.51$  m in the traditional therapy group. The tremendous diversity at baseline is non-negligible for directly analyzing post-treatment outcomes, because the posttest 6MWT value of the BWSTT group,

$640.00 \pm 97.99$  m, is even lower than the pretest value of the control group,  $685.71 \pm 176.51$  m. Calculating the difference between pretest and posttest, the efficacy of BWSTT is 300 m on average, which is higher than that of the control group (reaching  $\sim 130$  m on average). Actually, a contrast result was generated by extracting posttest outcomes only ( $640.00 \pm 97.99$  versus  $814.29 \pm 180.51$ ).

In addition, based on our experience and another systematic review published in *Spinal Cord* [4], the posttest outcome should be replaced by difference between pretest baselines and posttest outcomes when performing meta-analysis to compare the efficacy of merging physiotherapy interventions.

### Compliance with ethical standards

**Conflict of interest** The author declares that he has no conflict of interest.

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### References

1. Mehrholz J, Harvey LA, Thomas S. Is body-weight-supported treadmill training or robotic-assisted gait training superior to overground gait training and other forms of physiotherapy in people with spinal cord injury? A systematic review. *Spinal Cord*. 2017;55:722–9.
2. Kapadia N, Masani K, Craven BC, Giangregorio LM, Hitzig SL, Richards K, et al. A randomized trial of functional electrical stimulation for walking in incomplete spinal cord injury: effects on walking competency. *J Spinal Cord Med*. 2014;37:511–24.
3. Sadeghi H, Banitalebi E, Dehkordi M. The effect of body-weight-supported training exercises on functional ambulation profile in patients with paraplegic spinal cord injury. *Phys Treat*. 2015;4:205–12.
4. Harvey LA, Glinesky JV, Bowden JL. The effectiveness of 22 commonly administered physiotherapy interventions for people with spinal cord injury: a systematic review. *Spinal Cord*. 2016;54:914–23.

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