



Aalborg Universitet

AALBORG UNIVERSITY  
DENMARK

**Letter to the Editor concerning “The role of non-rigid cervical collar in pain relief and functional restoration after whiplash injury: a systematic review and a pooled analysis of randomized controlled trials” by Ricciardi L, et al. (Eur Spine J; [2019] 28:1821–1828)**

Christensen, Steffan W. M.; Skou, Søren T.

*Published in:*  
European Spine Journal

*DOI (link to publication from Publisher):*  
[10.1007/s00586-020-06372-0](https://doi.org/10.1007/s00586-020-06372-0)

*Publication date:*  
2020

*Document Version*  
Accepted author manuscript, peer reviewed version

[Link to publication from Aalborg University](#)

*Citation for published version (APA):*

Christensen, S. W. M., & Skou, S. T. (2020). Letter to the Editor concerning “The role of non-rigid cervical collar in pain relief and functional restoration after whiplash injury: a systematic review and a pooled analysis of randomized controlled trials” by Ricciardi L, et al. (Eur Spine J; [2019] 28:1821–1828). *European Spine Journal*, 29(5), 1191-1192. <https://doi.org/10.1007/s00586-020-06372-0>

**General rights**

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal -

**Letter to the editor concerning “The role of non-rigid cervical collar in pain relief and functional restoration after whiplash injury - a systematic review and a pooled analysis of randomized controlled trials”**

Steffan W. M. Christensen<sup>1,2</sup>, Søren T. Skou<sup>3,4</sup>

<sup>1</sup>*Department of Health Science and Technology, Aalborg University, Fredrik Bajers Vej 7D-3, 9220 Aalborg, Denmark,*

<sup>2</sup>*Department of Physiotherapy, University College of Northern Denmark (UCN), Selma Lagerløfs Vej 2, 9220 Aalborg, Denmark,*

<sup>3</sup>*Research Unit for Musculoskeletal Function and Physiotherapy, Department of Sports Science and Clinical Biomechanics, University of Southern Denmark, 5230 Odense, Denmark*

<sup>4</sup>*Department of Physiotherapy and Occupational Therapy, Næstved-Slagelse-Ringsted Hospitals, Region Zealand, 4200 Slagelse, Denmark.*

**ORCID**

Steffan W. M. Christensen: <https://orcid.org/0000-0001-9068-0641>

Søren T. Skou: <https://orcid.org/0000-0003-4336-7059>

**Declarations**

No ethical approval was needed, no funding was obtained and the authors have no conflicts of interests to declare. Both authors contributed to writing this letter to the editor.

**Corresponding author:**

Associate Professor Steffan Wittrup McPhee Christensen  
Department of Health Science and Technology, Aalborg University,  
Fredrik Bajers Vej 7D-3, Aalborg, Denmark,  
9220 Aalborg, Denmark  
E-mail: [stc@hst.aau.dk](mailto:stc@hst.aau.dk)

/

Department of Physiotherapy, University College of Northern Denmark,  
Selma Lagerløfs Vej 2  
9220 Aalborg, Denmark  
E-mail: [sec@ucn.dk](mailto:sec@ucn.dk)

We read with interest the systematic review by Ricciardi et al. [1] on the effect of non-rigid cervical collar (nRCC) in the rehabilitation of whiplash injury. The conclusion of their review favors an active “non-immobilization” approach [1], in line with most literature on the topic. However, after reading the review, we do have some methodological concerns that could have significant impact on the interpretation of the findings.

The authors aim to investigate if wearing a nRCC improves pain and cervical range of motion (ROM) more than not wearing an nRCC [1]. However, the review included four papers based on two RCT’s (Schnabel et al. [2]; Vassiliou et al. [3]; McKinney et al. [4]; McKinney [5]), which either equipped all participants, including the “non-immobilization” group, with a nRCC or allowed for it to be used in the first days after the injury. As all participants had access to and potentially used a nRCC, these studies are not appropriate to use to investigate the research aim of the systematic review. In addition, the included study by Kongsted et al. [6] clearly stated that they had used a “*semirigid Philadelphia neck collar*” and not a nRCC. This study is therefore not appropriate for the specific review aim either.

For the pooled data on the pain VAS scores, two papers (Schnabel et al. [2]; Vassiliou et al. [3]) included in the review seem to be based on the same patient population, although they are reported as two separate studies for the time interval “VAS t<3 m” [1]. Furthermore, Ricciardi et al. [1] displays VAS data as means and SD in a table in the review while the exact same values are presented as mean and SEM in the original papers from Mealy et al. [7] and Borchgrevink et al. [8]. Similarly, the ROM data from Mealy et al. [7] is also presented in the review [1] as mean and SD while the original paper has reported these values as mean and SEM.

Regarding ROM, the authors define this as “...*the degree of mean lateral flexion of the neck*” [1] in line with what is reported in the paper by McKinney et al. [4]. However, Mealy et al. [7] reports “*Total cervical movement-that is, flexion, extension, right and left lateral flexion, and right and left rotation-was calculated, giving a numerical score.*” which is not mentioned in the review [1].

Taken together, these methodological concerns of the review by Ricciardi et al. [1] may have a direct impact on the interpretation of the findings.

## References

1. Ricciardi L, Stifano V, D'Arrigo S, Polli FM, Olivi A, Sturiale CL (2019) The role of non-rigid cervical collar in pain relief and functional restoration after whiplash injury: a systematic review and a pooled analysis of randomized controlled trials. *Eur Spine J* 28:1821-1828. doi: 10.1007/s00586-019-06035-9
2. Schnabel M, Ferrari R, Vassiliou T, Kaluza G (2004) Randomised, controlled outcome study of active mobilisation compared with collar therapy for whiplash injury. *Emerg Med J* 21:306-310. doi: 10.1136/emj.2003.010165
3. Vassiliou T, Kaluza G, Putzke C, Wulf H, Schnabel M (2006) Physical therapy and active exercises--an adequate treatment for prevention of late whiplash syndrome? Randomized controlled trial in 200 patients. *Pain* 124:69-76. doi: 10.1016/j.pain.2006.03.017
4. McKinney LA, Dornan JO, Ryan M (1989) The role of physiotherapy in the management of acute neck sprains following road-traffic accidents. *Arch Emerg Med* 6:27-33. doi: 10.1136/emj.6.1.27
5. McKinney LA (1989) Early mobilisation and outcome in acute sprains of the neck. *BMJ* 299:1006-1008. doi: 10.1136/bmj.299.6706.1006
6. Kongsted A, Qerama E, Kasch H, Bendix T, Bach FW, Korsholm L, Jensen TS (2007) Neck collar, "act-as-usual" or active mobilization for whiplash injury? A randomized parallel-group trial. *Spine (Phila Pa 1976)* 32:618-626. doi: 10.1097/01.brs.0000257535.77691.bd
7. Mealy K, Brennan H, Fenelon GC (1986) Early mobilization of acute whiplash injuries. *Br Med J (Clin Res Ed)* 292:656-657. doi: 10.1136/bmj.292.6521.656
8. Borchgrevink GE, Kaasa A, McDonagh D, Stiles TC, Haraldseth O, Lereim I (1998) Acute treatment of whiplash neck sprain injuries. A randomized trial of treatment during the first 14 days after a car accident. *Spine (Phila Pa 1976)* 23:25-31