



LEEDS  
BECKETT  
UNIVERSITY

---

Citation:

Sawczuk, T and Jones, B and Scantlebury, S and Till, K (2017) Sensitivity of daily wellbeing and neuromuscular fatigue measures to training load and sleep in high school age athletes. In: NSCA 2017 National Conference, 12 July 2017 - 15 July 2017, Las Vegas, NV.

Link to Leeds Beckett Repository record:

<https://eprints.leedsbeckett.ac.uk/id/eprint/6209/>

Document Version:

Conference or Workshop Item (Published Version)

---

The aim of the Leeds Beckett Repository is to provide open access to our research, as required by funder policies and permitted by publishers and copyright law.

The Leeds Beckett repository holds a wide range of publications, each of which has been checked for copyright and the relevant embargo period has been applied by the Research Services team.

We operate on a standard take-down policy. If you are the author or publisher of an output and you would like it removed from the repository, please [contact us](#) and we will investigate on a case-by-case basis.

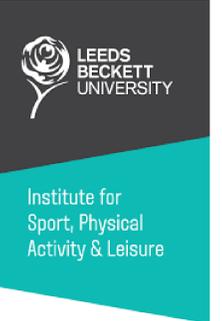
Each thesis in the repository has been cleared where necessary by the author for third party copyright. If you would like a thesis to be removed from the repository or believe there is an issue with copyright, please contact us on [openaccess@leedsbeckett.ac.uk](mailto:openaccess@leedsbeckett.ac.uk) and we will investigate on a case-by-case basis.



# SENSITIVITY OF DAILY WELLBEING AND NEUROMUSCULAR FATIGUE MEASURES TO TRAINING LOAD AND SLEEP IN HIGH SCHOOL AGE ATHLETES

Thomas Sawczuk<sup>1,2</sup>, Ben Jones<sup>1,2,3</sup>, Sean Scantlebury<sup>1,2</sup>, Kevin Till<sup>1,3</sup>  
[t.sawczuk@leedsbeckett.ac.uk](mailto:t.sawczuk@leedsbeckett.ac.uk); @Tom\_Sawczuk

<sup>1</sup>Leeds Beckett University, Leeds, UK <sup>2</sup>Queen Ethelburga's Collegiate, York, UK <sup>3</sup>Yorkshire Carnegie RUFC, UK



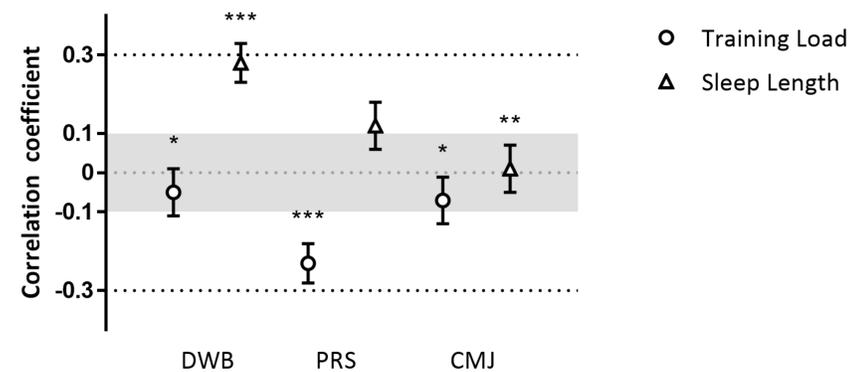
## INTRODUCTION

- Previous studies have shown the sensitivity of daily wellbeing questionnaires (DWB) and countermovement jumps to training load in elite adult athletes. <sup>1,2</sup>
- Sleep length has previously been shown to affect mood, but no study has yet considered its impact on wellbeing questionnaires alongside training load. <sup>3</sup>
- The purpose of this study was to assess the sensitivity of a DWB, the Perceived Recovery Status scale<sup>4</sup> (PRS) and countermovement jumps (CMJ) to training load and sleep length in high school age athletes.

## METHODS

- Fifty-two high school age athletes (age 17.3 ± 0.6 years, height 173.0 ± 18.2 cm, body mass 73.7 ± 12.6 kg) volunteered to participate in this eight week study.
- Prior to their first training session of the day, participants:
  - Completed DWB and PRS
  - Provided details on the previous day's training loads and sleep length
  - Completed 3 maximal CMJs
- Partial correlations were used to assess the linear relationship between DWB, PRS and CMJ with training load and sleep length.
- Correlation coefficients (*r*) were calculated and magnitude based inferences were used to assess for practical significance.

## RESULTS



**Figure 1: Graphical depiction of correlation coefficients for DWB, PRS and CMJ. Asterixes denote the likelihood that the correlation coefficient is greater than the smallest worthwhile change (shaded area): \* likely; \*\* very likely; \*\*\* most likely.**

	5	4	3	2	1
<b>FATIGUE</b>	Very fresh	Fresh	Normal	More tired than normal	Always tired
<b>SLEEP QUALITY</b>	Very restful	Good	Difficulty falling asleep	Restless sleep	Insomnia
<b>GENERAL MUSCLE SORENESS</b>	Feeling great	Feeling good	Normal	Increase in soreness/tightness	Very sore
<b>STRESS LEVELS</b>	Very relaxed	Relaxed	Normal	Feeling stressed	Highly stressed
<b>MOOD</b>	Very positive mood	A generally good mood	Less interested in others &/or activities than usual	Snappiness at teammates, family and co-workers	Highly annoyed/irritable/down

- 10 Very well recovered / Highly energetic
- 9 Well recovered / Somewhat energetic
- 8 Well recovered / Somewhat energetic
- 7 Moderately recovered
- 6 Adequately recovered
- 5 Somewhat recovered
- 4 Somewhat recovered
- 3 Not well recovered / Somewhat tired
- 2 Not well recovered / Somewhat tired
- 1 Very poorly recovered / Extremely tired
- 0 Very poorly recovered / Extremely tired



## RESULTS

- There was a *most likely* small positive relationship between DWB and sleep length ( $r = 0.28; \pm 0.05$ ).
- There was a *most likely* small negative relationship between PRS and training load ( $r = -0.23; \pm 0.05$ ).

## PRACTICAL APPLICATIONS

- Subjective measures of wellbeing are more sensitive to training loads and sleep length than neuromuscular measures.
- The PRS is a simple tool for monitoring an individual's response to training.
- The DWB may provide a more complete understanding of the high school athlete's wellbeing but this comes at the expense of its sensitivity to training load.

## REFERENCES

- McLean, B. D., Coutts, A. J., Kelly, V., McGuigan, M. R., & Cormack, S. J. (2010). Neuromuscular, endocrine, and perceptual fatigue responses during different length between-match microcycles in professional rugby league players. *International Journal of Sports Physiology and Performance*, 5, 367–383.
- Thorpe, R. T., Strudwick, A. J., Buchheit, M., Atkinson, G., Drust, B., & Gregson, W. (2017). The influence of changes in acute training load on daily sensitivity of morning measured fatigue variables in elite soccer players. *International Journal of Sports Physiology and Performance*, 12, S2107-S2113.
- Oginska, H., & Pokorski, J. (2006). Fatigue and mood correlates of sleep length in three age-social groups: School children, students, and employees. *Chronobiology International*, 23, 1317-1328.
- Laurent, C. M., Green, J. M., Bishop, P. A., Sjøkvist, J., Schumacher, R. E., Richardson, M. T., & Curtner-Smith, M. (2011). A practical approach to monitoring recovery: Development of a perceived recovery status scale. *Journal of Strength and Conditioning Research*, 25, 620–628.

## ACKNOWLEDGEMENTS

The research, travel and conference fees for this poster were funded by the Carnegie Adolescent Rugby Research (CARR) project.