Examination of Fatigue-Induced Alterations in the Dynamic Postural Control of NCAA Division III Athletes as Measured by the Star Excursion Balance Test

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Abstract

The Star Excursion Balance Test (SEBT), which was first proven reliable through a study in 1996, is a tool that has been used to test dynamic postural control. This specific test measures the athlete’s strength, flexibility, neuromuscular control, core stability, range of motion, balance, and proprioception, which are all important for preventing injury or participating in any sport. Dynamic postural control can be affected by increased muscle fatigue, which can increase the risk of injury and affect performance. Therefore, the purpose of this research project was to examine the effect of muscle fatigue on dynamic postural control, as measured by the SEBT, which may impact sports performance.

Purpose

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Methods

Participants in this investigation:
- Participants included 20 men and women NCAA Division III athletes, including both in-season and out-of-season sports.
- Inclusion criteria were 18 years of age or older.
- Exclusion criteria included athletes participating in the study.

Fatigue Results

The SEBT scores were significantly reduced in the fatigue condition compared to the control condition. The mean SEBT score for the control condition was 1.21 ± 0.29, while the mean SEBT score for the fatigue condition was 0.98 ± 0.24. The difference was statistically significant (p < 0.05).

Conclusion

For our sample, final SEBT scores generally decreased as final RPE scores increased, but this negative correlation was not statistically significant.

There was a significantly different change between pre and post-test combined scores, depending on gender, using the Star Excursion Balance Test.

Overall decrease in reach for all participants was significant (p < 0.05), but differences among sports were not significant (p > 0.05).

Genders reported similar levels of fatigue according to their RPE, but SEBT results varied between males and females.

Limitations and Future Considerations

Small sample size
- A larger sample size is recommended to increase possible findings.

Unequal sample between gender
- Recommended to have a more equal split between male and female participants.

No warm-up was completed prior to the pre-test SEBT.

A warm-up prior to the pre-test SEBT may provide a more accurate pre-test result.

Participants

- 20 total participants
- 6 different sports represented
- 11 males
- 9 females

Fatigue Protocol

Altered standing balance board protocol
- Combined Reach Results Non-dominant vs. Dominant
- Combined reach results for non-dominant leg decreased for both males (p < 0.05) and females (p < 0.05)

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