

Effects of Ankle Bracing on the Performance of the Dynamic Postural Stability Index

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Introduction

- Dynamic postural stability is the ability to maintain stability when transitioning from a dynamic to static state.⁽¹⁾
 - Maintaining stability when transitioning from dynamic to static state is important to prevent injury from cutting movements or sudden change in direction.
- Dynamic postural stability can be measured using the Dynamic Postural Stability Index (DPSI), which is calculated using its directional components, Anterior-Posterior Stability Index (APSI), Medial-Lateral Stability Index (MLSI), and Vertical Stability Index (VSI).⁽¹⁾
- Ankle braces are a common method of treatment for individuals who have sustained an ankle injury.⁽²⁾
- With evidence that ankle bracing can enhance ankle proprioception, ankle bracing may enhance performance during DPSI testing because dynamic balance relies on proprioception and somatosensory feedback.

Purpose

- To determine if prophylactic ankle braces have an effect on DPSI values.
- We hypothesized that the application of an ankle brace would improve dynamic postural stability.

Materials and Methods

- Subjects: 31 college-aged individuals (7 males, 24 females) who were physically active and had not worn an ankle brace in the last five years.
- Subjects jumped a distance that was 40% of their height and over a 12 inch hurdle, landing on their dominant foot on an Accupower force platform.
- Subjects held their landing position for four seconds, and data was collected at 200 Hz.
- Three jumps were performed for each trial (with and without an ankle brace) with a two minute rest period in between each jump.
- Average DPSI, APSI, MLSI, and VSI values for each trial were used for data analysis.
- A paired samples t-test was used for data analysis to compare the two treatments.

Results

- No significant difference between braced (0.086 ± 0.011) and non-braced (0.087 ± 0.015) conditions was found for average APSI values [$t(30) = -0.46, p > .05$].
- No significant difference between braced (0.036 ± 0.014) and non-braced (0.036 ± 0.013) conditions was found for average MLSI values [$t(30) = 0.00, p > .05$].
- No significant difference between braced (0.310 ± 0.0395) and non-braced (0.30 ± 0.043) conditions was found for average VSI values [$t(30) = 1.33, p > .05$].
- A nonsignificant difference between braced (0.325 ± 0.039) and non-braced (0.319 ± 0.044) conditions was found for average DPSI values [$t(30) = 1.25, p > .05$].

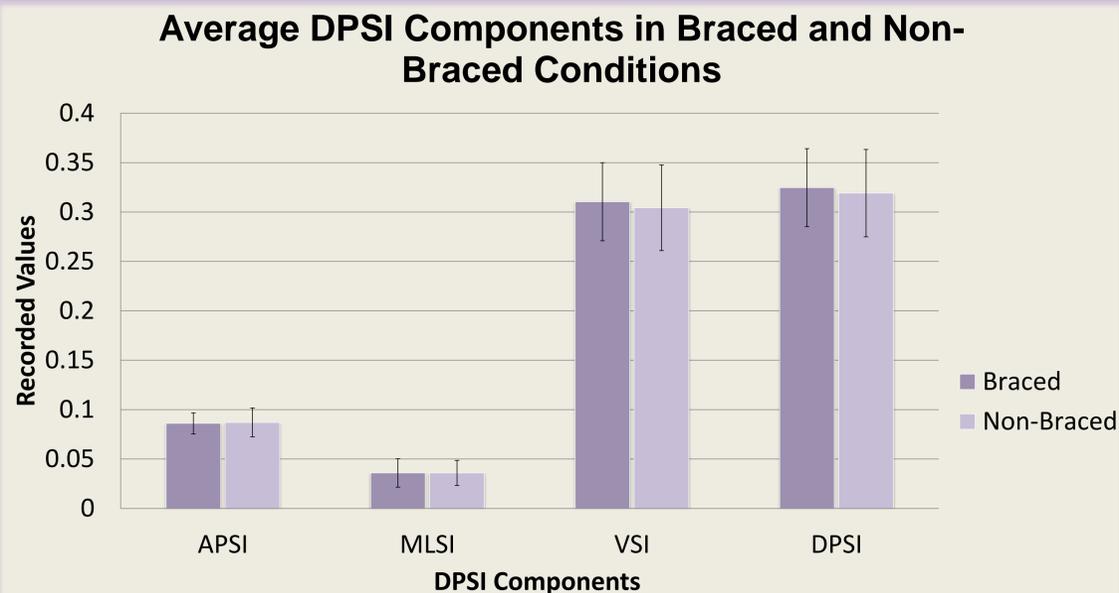


Figure 1: DPSI values were calculated and recorded for both treatments (braced and non-braced)



Figure 2: Starting jump position



Figure 3: Jump landing position

Discussion

- Average APSI, MLSI, VSI, and DPSI values were very similar with and without an ankle brace, suggesting that the application of an ankle brace does not affect dynamic postural stability.
- The benefits of wearing an ankle brace may not apply to a healthy individual because they do not have neuromuscular deficits (i.e. numbness, swelling, muscle weakness, limited mobility, etc.) that an injured athlete may have when seeking assistance from an ankle brace. However, if healthy athletes choose to wear an ankle brace as a protective mechanism, they can do so without limiting performance.
- Future research may examine the differences in the effect of ankle bracing on the DPSI between healthy and injured athletes.
- The current results are similar to previous research.^(1,3) However, previous researchers found that VSI values were significantly reduced with the application of an ankle brace, which conflicts with the current results.⁽¹⁾

Conclusion

- Wearing an ankle brace has no effect on the performance of the DPSI. Ankle braces will neither enhance nor inhibit dynamic postural stability.

Literature Cited

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