



144 Hz vibration does not enhance shoulder control

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Background

Stability of the upper extremity is critical for injury prevention. Vibration may improve proprioception, reducing injury risk. However, traditional vibration methods may be expensive and require a significant level of skill by the technician.

Objective

Our purpose was to investigate whether an acute bout of shoulder exercise performed with an inexpensive, user-friendly vibration toy ball (BumbleBall, Cardinal Laboratories) improves shoulder position sense and joint control.

Setting

Liberal arts undergraduate institution in USA.

Participants

Thirty subjects (age 18-22, 22 female) completed all trials. Subject level of activity ranged from non-athletes to collegiate athletes. Exclusion criterion was an upper extremity injury in the previous month.

Design

Prior to the exercise bout, participants were assessed for motion sway (path length) using a custom iPhone application previously shown reliable.

Participants completed an acute bout of shoulder exercise with and without vibration on separate visits.

Path length was reassessed following the exercise bout. A 2-way repeated measures ANOVA was used to determine differences between conditions (vibration/no vibration) and time (pre/post). Significant main effects were examined using paired t-tests – $p < 0.05$

Intervention

Sessions started with a warm-up (5 min jump rope) and an app measure.

Each subject held the phone on the palm, arm forward at eye level for 20 seconds each arm for all trials.

Each subject then completed a full can exercise set with the randomly assigned BumbleBall state (vibration/no vibration), and then repeated the app stability measure.

The toy vibrates at 144 Hertz with an amplitude of 8 mm.

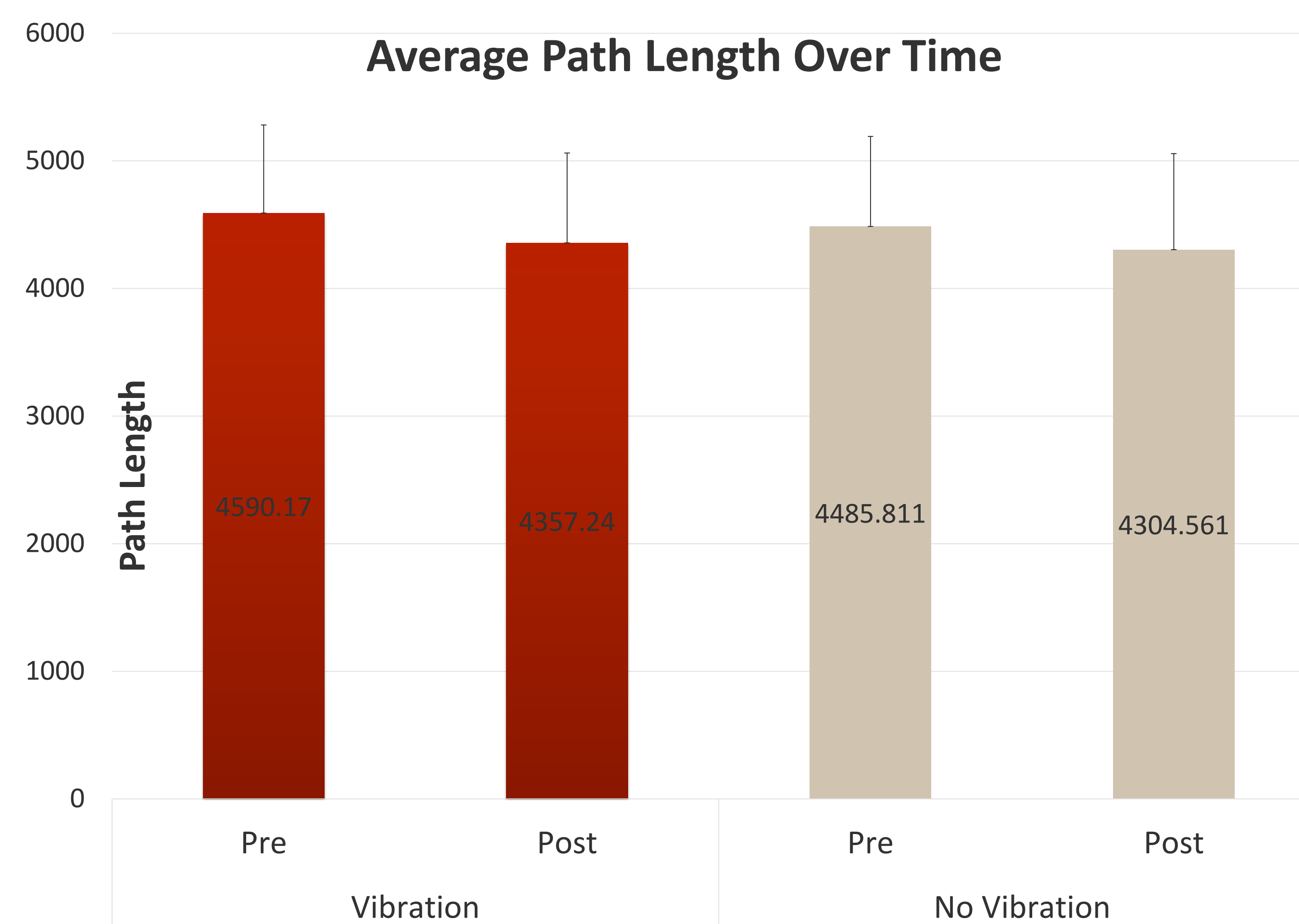
The session was repeated 48 hours later with the other state (vibration/no vibration)

Main Outcome Measurements

Average path length before and after use of the BumbleBall (vibration/no vibration) assessed this intervention.



Results



There was a significant ($p = 0.009$ and $\eta^2 = 0.27$) main effect of time. There were no significant ($p > 0.05$) 2-way interactions between condition and time.

Conclusions

The vibration of this inexpensive toy at 144 Hz did not improve shoulder proprioception.

References

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