Muscles That Yields More Force in the Plank

Brittany Evans
Department of Health and Human Performance, Radford University, Virginia 24142

Introduction

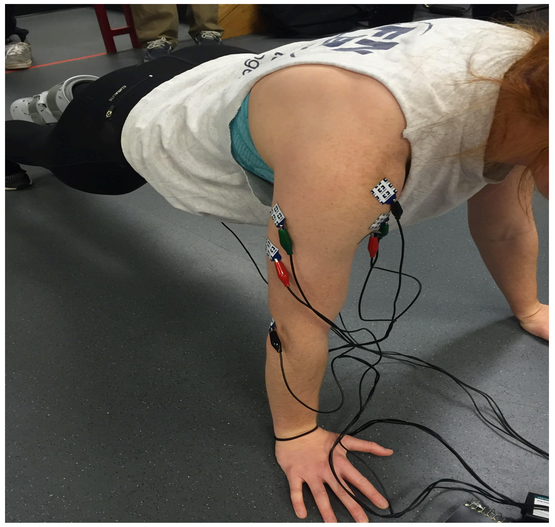
- Core training has become a popular component of resistance training.
- Programmers assume that the plank exercise is a core training movement but evidence-based assessment is lacking.

Purpose

- Core strength is essential to functional training.
- The core stabilizes muscles the control movements of the upper and lower body limbs.
- The plank is assumed to strengthen core muscles but because shoulder and elbow joint muscles also contribute, it is unclear if the plank is an exercise for the upper limb or abdominal muscles
- The purpose of this study was to determine if the anterior deltoids, the triceps brachii, the rectus abdominis, or the pectoralis major yields more force when in a full arm plank position.

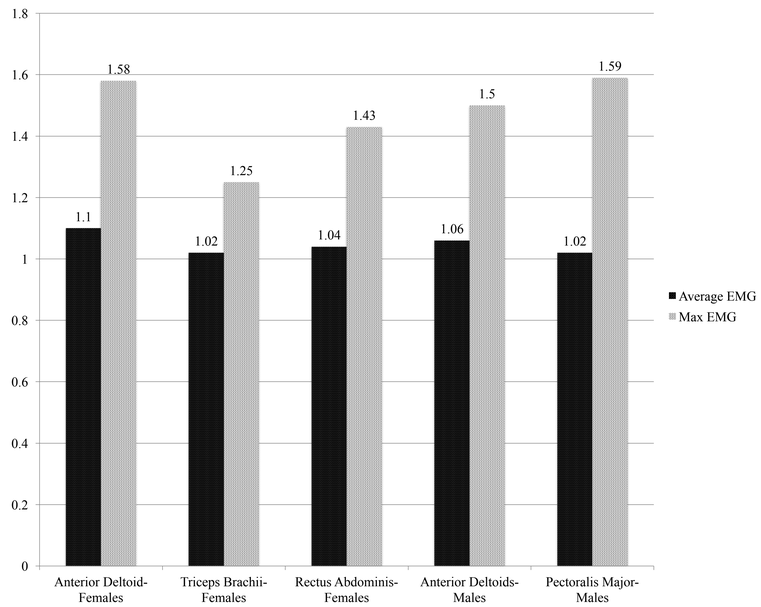
Method

- The plank was assessed on 20 college students, 10 females and 10 males.
- Using an ElectroMyoGram (EMG) separate sensors were placed on individual muscles.
- For females, EMG activity of the anterior deltoid, triceps brachii, and the rectus abdominis was assessed.
- For the males, EMG activity of the anterior deltoid and pectoralis major was assessed.
- After the sensors were placed each participant was asked to hold a thirty-second full arm plank while maintaining core stabilization.
- Average EMG across thirty seconds and maximum EMG activity were recorded for each muscle.



Printing Supported by the Office of Undergraduate Research and Scholarship

Results



Conclusion

- Females
  - Anterior deltoid yields the most force followed by Rectus abdominis and triceps
- Males
  - Anterior deltoid generates more force than the pectoralis
- Conclusion
  - Upper body strength, rather than core strength, supports the plank movement.