Effect of Core Stabilization Training for Improved Running Performance, Efficiency, and Injury Prevention Young In Novice Athletes: A Systematic Review

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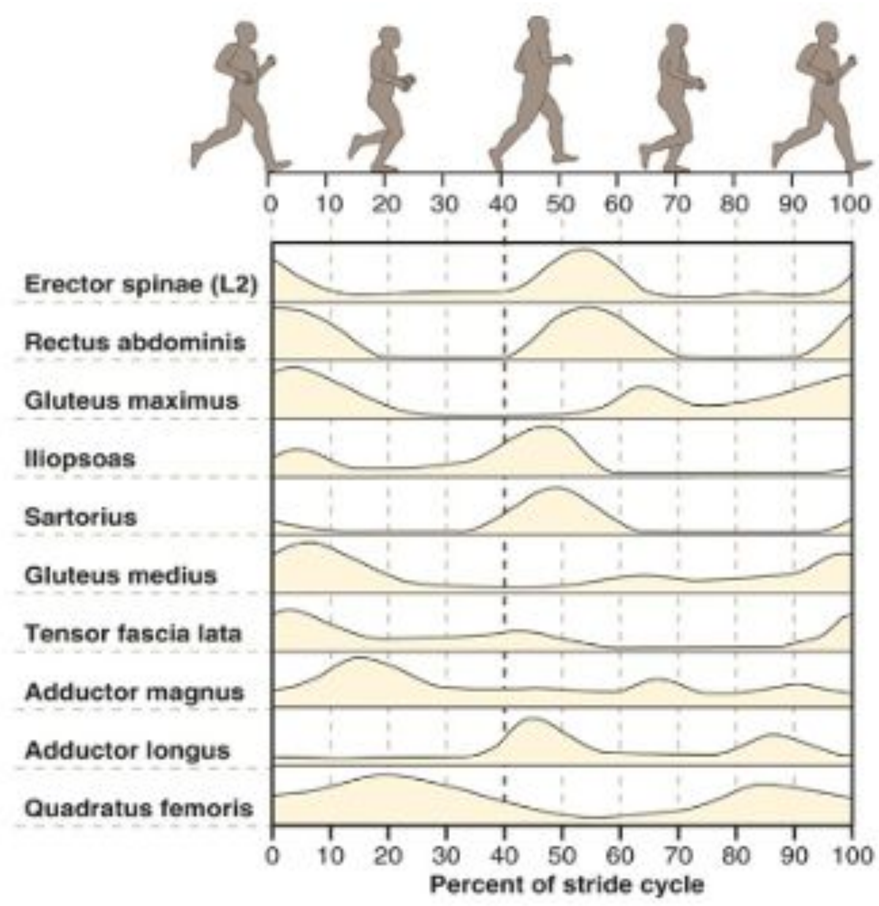
Purpose

Determine the effect of core stabilization training on running performance, efficiency, & risk of injury in young novice athletes.

Background

Muscles work together as agonists, antagonists, synergists, or stabilizers to perform a movement. When a muscle acts as a stabilizer, it prevents excessive movement at one joint and ensures adjacent joints can function optimally.



Hypothesis

While running, if a subject's core musculature stabilized the spine and pelvis, muscles in the lower extremity would have an improved ability to control lower extremity movement and therefore improve running efficiency and decrease the incidence of injury.

Methods

Three researchers carried out the literature review, analyzed, and classified the articles. The PEDro scale and hierarchy of evidence scale that was adapted from the Oxford Centre of Evidence-based Medicine were used to assess the quality of the articles.

Search Strategy

SCAN ME

References

SCAN ME

Results

The researchers analyzed a total of 12 articles. The average PEDro score was 5.58/10 and an average LOER of 2.5. The researchers found that six articles had supporting evidence, while three had evidence that was not supportive of our hypothesis, and three had contrasting evidence.

Supporting	Non-Supporting	Contrasting
Kubo et al. 2011	Hoshikawa et al. 2019	Hoenig et al. 2018
Jamison et al 2012	Mehdizadeh et al. 2014	Fujita et al. 2019
Jamison et al. 2013	Prieske et al. 2016	Chaudhari et al. 2020
Schuermans et al. 2017		
Clark et al. 2017		
Hung et al. 2019		

Conclusions

Research yielded conflicting results that core strengthening/stability is related to improvements in running performance and efficiency, as well as risk of injury in young athletes. Therefore, further data collections need to be conducted.

Likely causes of conflicting results

- Variable measurement techniques
- No homogeneity in exercise programs, most lacked functional/dynamic activities

Interstudy Themes

- Longer duration core program positively correlated with improved athletic performance
- Muscle activation of the core is important during specific phases of the running gait cycle

What should future research include?

- Core training program consisting of functional and dynamic exercises.
  - Duration of program ~16-24 weeks
  - Standardized progression guideline
  - As an adjunct to sport specific routine

Suggested initial phase of core program for future data collection

Exercise	**Parameters** **Phase 1: ~4 weeks**
Bird-Dogs	3X8-12 each side
Single Leg Romanian Deadlift	3X8-12 each side
Half-Kneeling Pallof Press	2X8-12 each side
Step-Ups with contralateral dumbbell	2X8-12 each side