How Do Back Injuries Impact Back Flexibility In College Athletes?

Akacia Robles, Rachael Akintade, Carolina Rios, & Dean Smith
Faculty Mentor: Logan Moore, Ph.D.
EXS 2304: Data Collection, Human Performance Laboratory
Texas Wesleyan University

Introduction

One of the most prevalent musculoskeletal disorders is low back pain (LBP) affecting a significant amount of the athletes (Miñambres-Martín et al., 2022). Young athletes who present with low back pain are more likely to have structural injuries; therefore, flexibility and muscular imbalances should be addressed in their treatment (Purcell & Michel 2009). The possible contributions of low back pain include impaired hamstring flexibility, low strength of trunk extensors, lumbar disc herniation, and individual demographic characteristics like menstruation (Hori et al., 2021; Iwai et al., 2004; Sweeney et al., 2019).

The overall purpose of this assessment is to determine the effects of lower back pain when dealing with flexibility.

Methodology

Inclusion and Exclusion Criteria:
Athletes with a history of back injury
No defects in functional ability

Participants:
3 Females and 3 Males with no injury, 3 Females and 3 Males cleared to play from injury

Sit and Reach:
The subject sat, feet together and stretched out in front of them. They then were told to reach as far forward towards their toes as possible. The displacement between their fingers and toes was measured in inches. This was conducted twice, and the average was recorded.

Skin Distraction:
The subjects stood straight up, the tester then placed the tape measure in the middle of the lower back, between the hip joints, measured out 15 cm and kept their finger on that point. Then, the tester had the participant bend forward as far as possible. The displacement of the skin was measured here. This trial was done twice for each participant, the average was taken, and the data was collected.

Data analysis:
Data were recorded in Excel as the mean of the two trials. Two-sided t-tests compared the groups, with significance set at $p < 0.05$.

Results

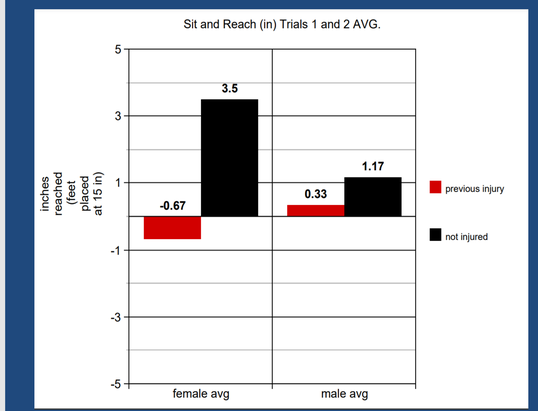


Figure 1: Sit and Reach Test (in) Trials 1 and 2 AVG.

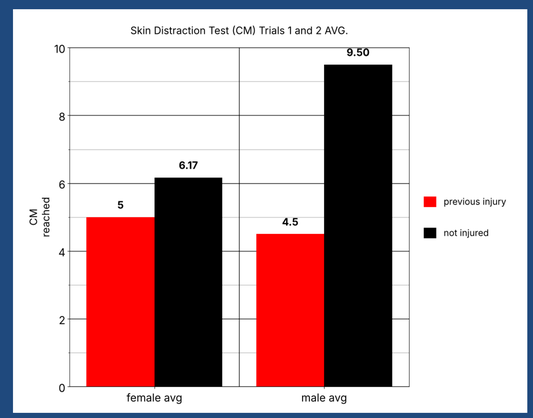


Figure 2: Skin Distraction Test (CM) Trials 1 and 2 AVG.

Male	Sit avg (In)	Skin avg (CM)
cleared	0.33	4.50
No injury	1.17	9.50
T-test	0.635	0.183

Figure 3: Male Test AVG and T-test Results

Female	Sit avg (IN)	Skin avg (CM)
Cleared	-0.67	5.00
No injury	3.50	6.17
T-test	0.185	0.256

Figure 4: Female Test AVG and T-test Results

Combined	Sit avg (In)	Skin avg (CM)
Cleared	-0.17	4.75
No injury	2.33	7.83
T-test	0.123	0.09

Figure 5: Combined Test AVG and T-test Results

Results (cont.)

Sit and Reach Test Among the previously injured females, they averaged a displacement of −0.67 inches (0.67 inches prior to reaching their toes) while the uninjured females averaged a displacement of 3.5 inches, resulting in a P value of 0.185. In a similar fashion, the previously injured males averaged a displacement of 0.33 inches, while the uninjured males averaged a displacement of 1.17 inches, resulting in a P value of 0.635.

Skin Distraction Among the previously injured females, they averaged a displacement of 5 cm, while the uninjured females averaged 6.17 cm resulting in a P value of 0.256. Also in a similar fashion, the injured males averaged a displacement of 4.5 cm and the uninjured males averaged 9.50 cm resulting in a P value of 0.183.

When male and female data were combined, there was a calculated p value of 0.123 on the sit and reach test. The skin distraction test had a P value of 0.088. These trends suggest that with more participants, a significant difference may (or may not) emerge, which would indicate that back injuries do affect athletes' lumbar flexibility.

Conclusion

Lumbar flexibility between previously injured and uninjured athletes did vary, but there were no significant differences between the two athlete groups. **With this quantity of participants, this study suggested that back injuries did not significantly affect the college athletes.**

References

Hori et al 2021. p theory. 37(5): 559–582
Purcell & Michel 2009. sports health. 1(3):212-222 Sweeney et al., 2019. sport medicine. 29(5):379–383 Miñambres-Martín et al., 2022. ijerph. 19(6): 3743
Iwai et al., 2004. sports & exercise. 36(8): 1296–1300