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Balance Inefficiencies in Athletes with Lower Extremity Surgeries

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Finding Balance Inefficiencies in Athletes with Lower Extremity Surgeries



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Abstract

The purpose of this study is to observe the initial difference in the balance of athletes with and without lower extremity surgeries; and determine whether a simple balance intervention is impactful. After four weeks of this program, we will determine if the volunteers' balance has remained the same, progressed, or declined and if the athlete has overcompensated in the injured extremity.

Methods

20 participants total, 18 male and 2 female
(20.05 years ± 1.95, 70.5 inches ± 7.5, 167.3 pounds ± 46.7)

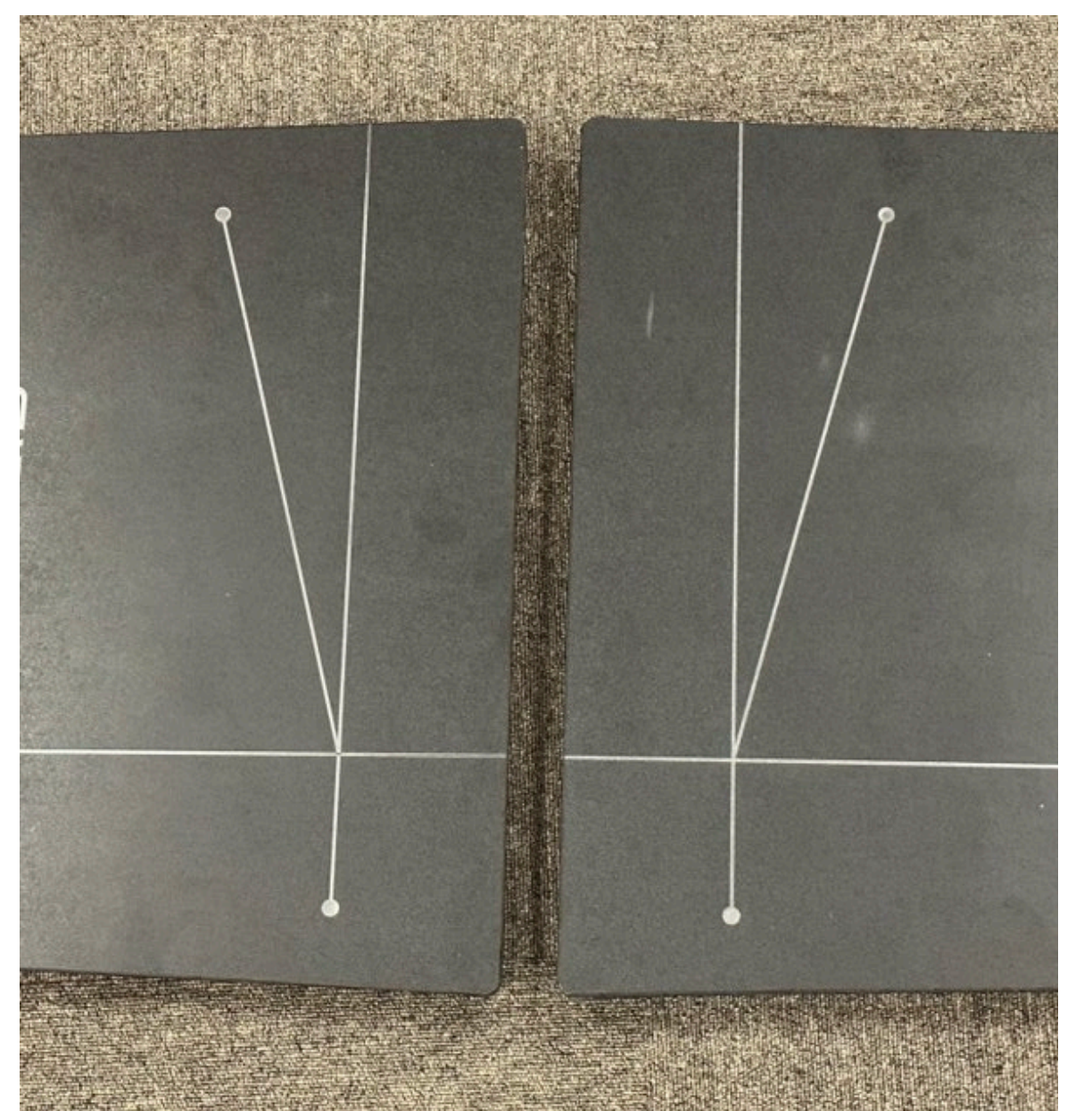
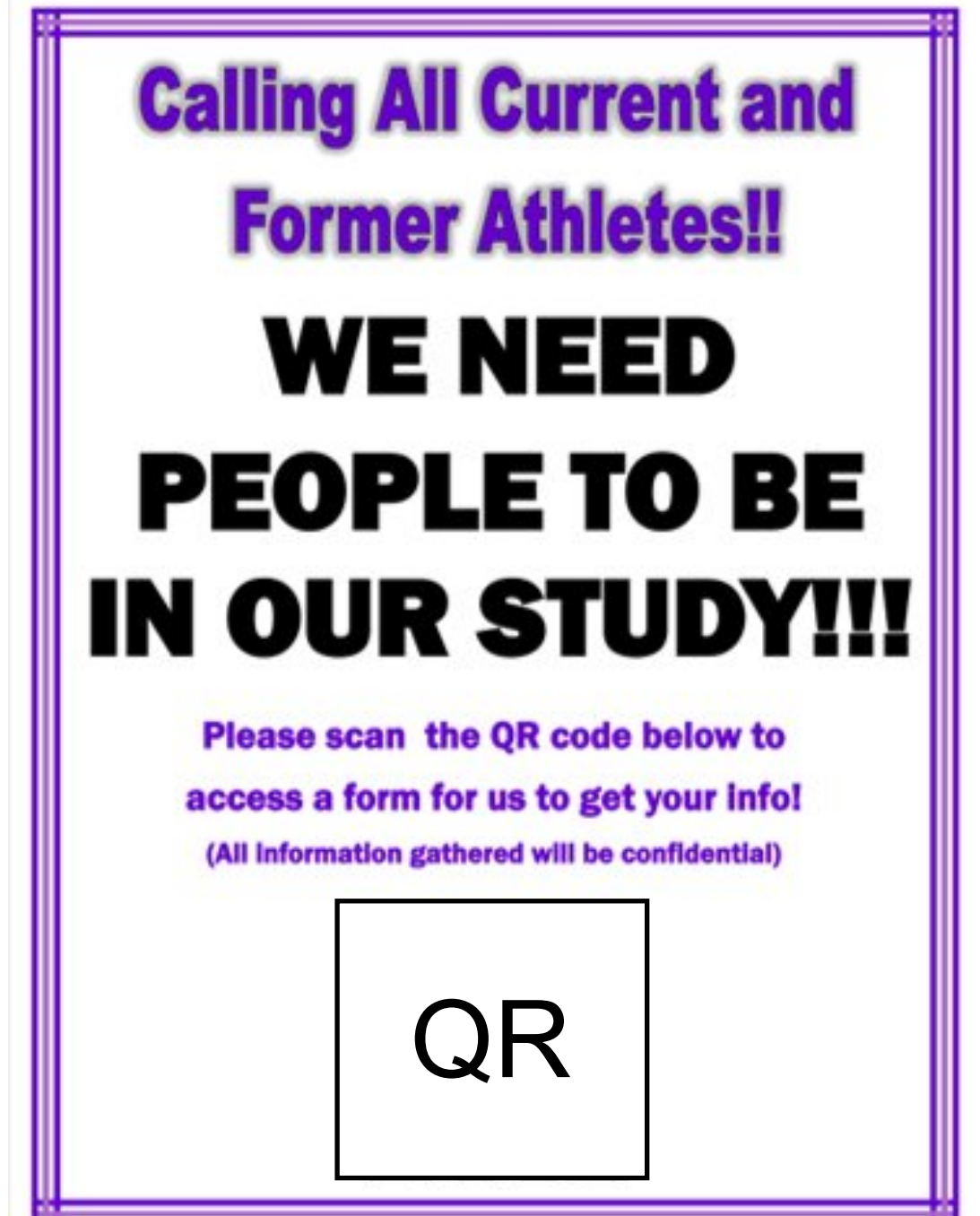
A form with a QR code was developed and placed around campus. The QR code led to a Google Form for potential participants to fill out their information.

An IRB Human Subjects Review Application was approved in order to officially start conducting the research
IRB #: ARN083023

The athletes came to the Biomechanics Lab for balance testing, using the single-leg balance test on the Kinvent K-Delta Force Plates.

The volunteers were instructed to stand for thirty seconds on each leg, once daily for four weeks, on an uneven surface, like a towel or pillow.

After four weeks, the same procedures for the first round of testing were used to retest balance measurements on the force plates.



Results

The results of this study showed that the simple single-leg balance intervention improved 80% of participants' balance. 7 out of the 10 athletes with surgeries improved balanced significantly more on the leg that was operated on.

Average Improvement

	Left	Right
Surgery	240.1 mm ²	69.1 mm ²
Non-Surgery	277.2 mm ²	110.6 mm ²

Operated Leg	Healthy Leg
259.2 mm ²	50.0 mm ²

Conclusion

As the results reveal that 80% of the volunteers improved their overall balance from the first round of testing to the second, one can also see that the group of athletes who had a lower extremity surgery improved significantly more on the side that was operated on. This proves that the simple balance intervention did work, however, it would be interesting to see how a more specific group of participants might change the results. The improvement rate between athletes of different sports could be the next research topic. Testing all athletes is a very vague requirement, which could range anywhere from a small, female, swimmer, to an offensive lineman. Therefore, studies with more specific qualifications might show more detailed results. These qualifications might consist of results from a specific sex, age group, sport, or even position within a sport. Gaining information from more specific groups would be beneficial in progressing the field of kinesiology and injury prevention. Overall, the research that was performed was a success, proving that a very minor intervention can have a big impact on an individual's balance and stability of the lower extremities.

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