

Introduction

Achilles tendinopathy (AT) is a common overuse injury in running or jumping activities where the tendon is unable to properly respond to the load. AT increases tendon thickness while decreasing stiffness and function (1). Studies have shown that tendon properties can be positively influenced by load (5,6). Therefore, AT has typically been treated conservatively through physical therapy, with eccentric calf strengthening exercises as the focus of the treatment (2).

Hypothesis

Heavy load eccentric exercise will:



Methods

Inclusion: positive pinch test + AT thickness on US

Exclusion: previous participation in the study and other Achilles tendon conditions

23 tendons

FAAM Ultrasound VISA-A

THE PROTOCOL

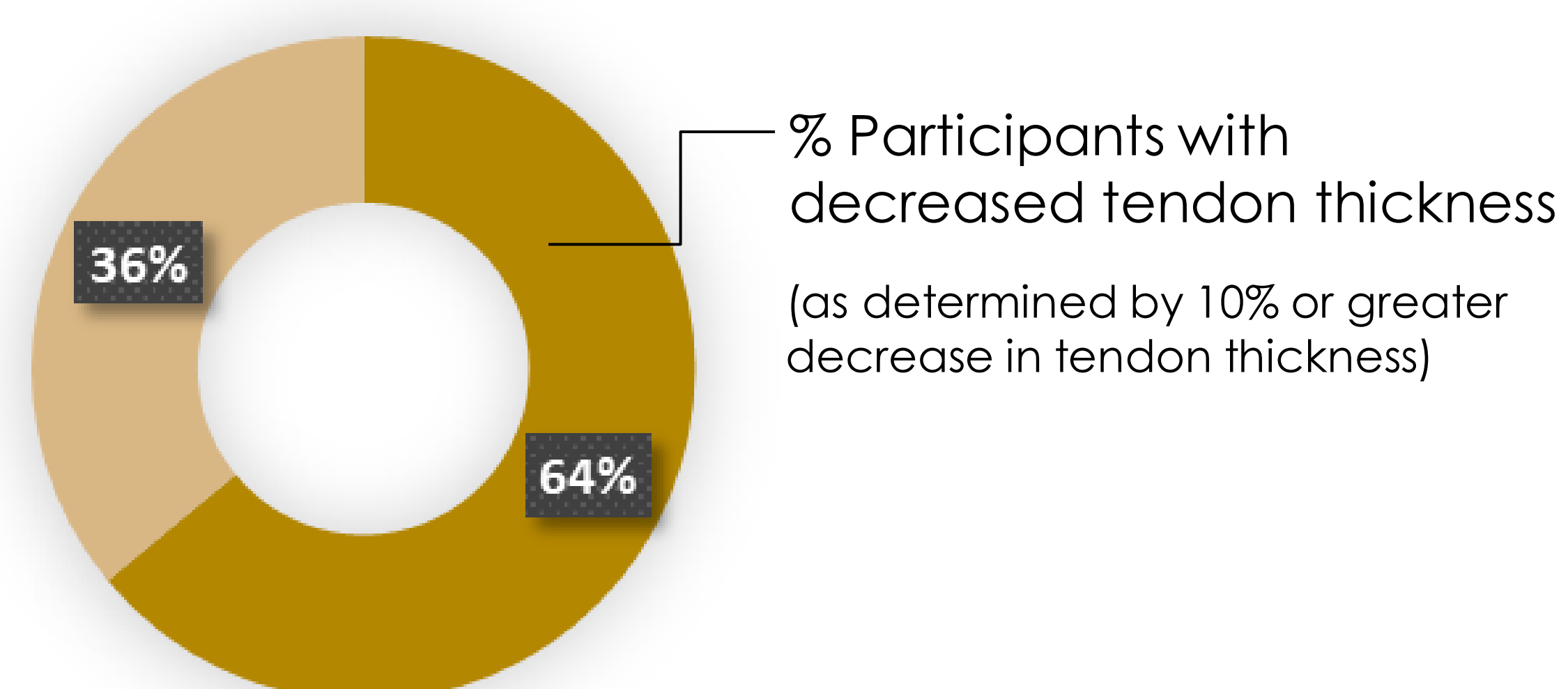
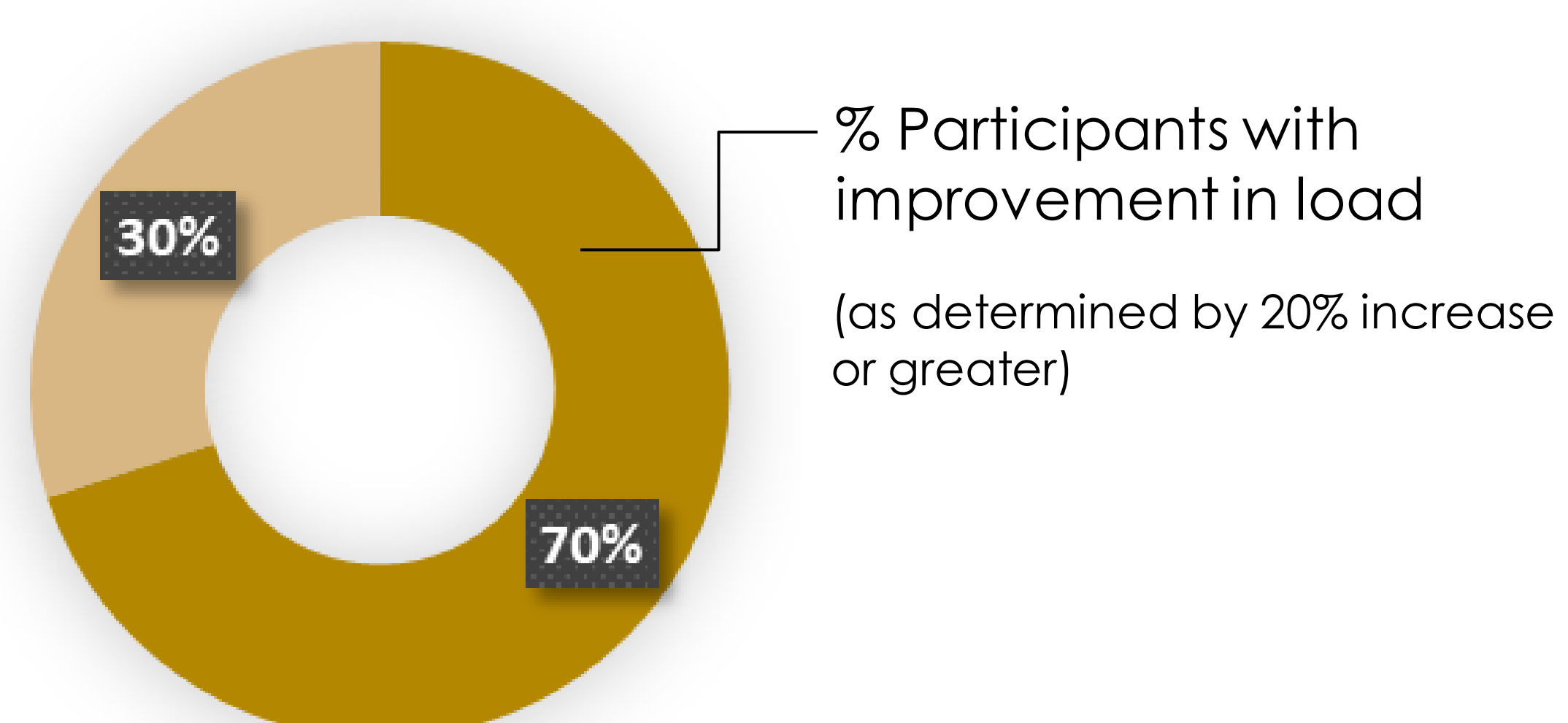
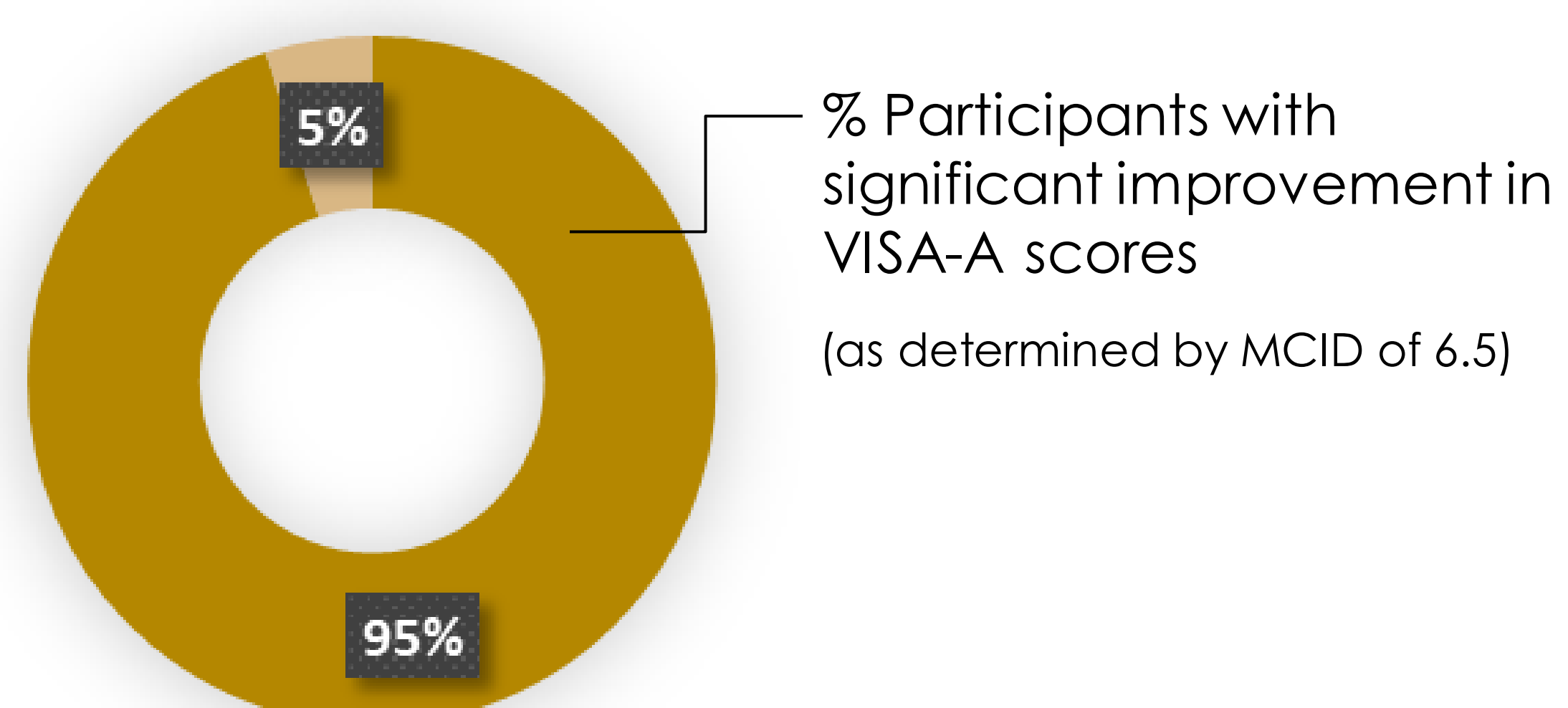
- 10-Weeks, 3x weekly, 1-day rest between
- Dynamic Warm-Up
- 3x6-8 double leg concentric plantarflexion and single leg eccentric dorsiflexion

“Up with two, down with one”

Results

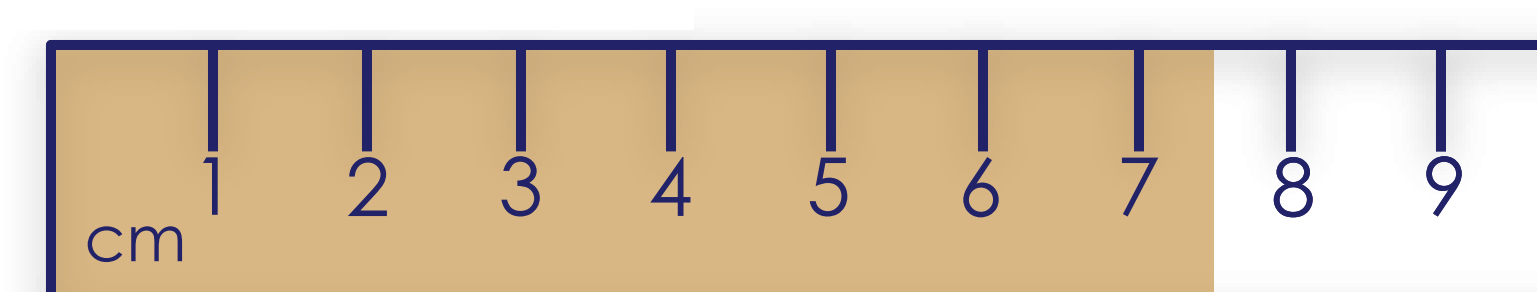
	VISA-A (10-weeks)	VISA-A (half-year)	FAAM (10-weeks)	Resistance Load (average)	Tendon Thickness (average)
pre	65	65	70	191	0.75 cm
post	89	94	80	263	0.66 cm
% change	↑ 38%	↑ 46%	↑ 16%	↑ 41%	↓ 14%
p-value	<0.001	<0.001	<0.001	<0.001	<0.001

Percent Improvement

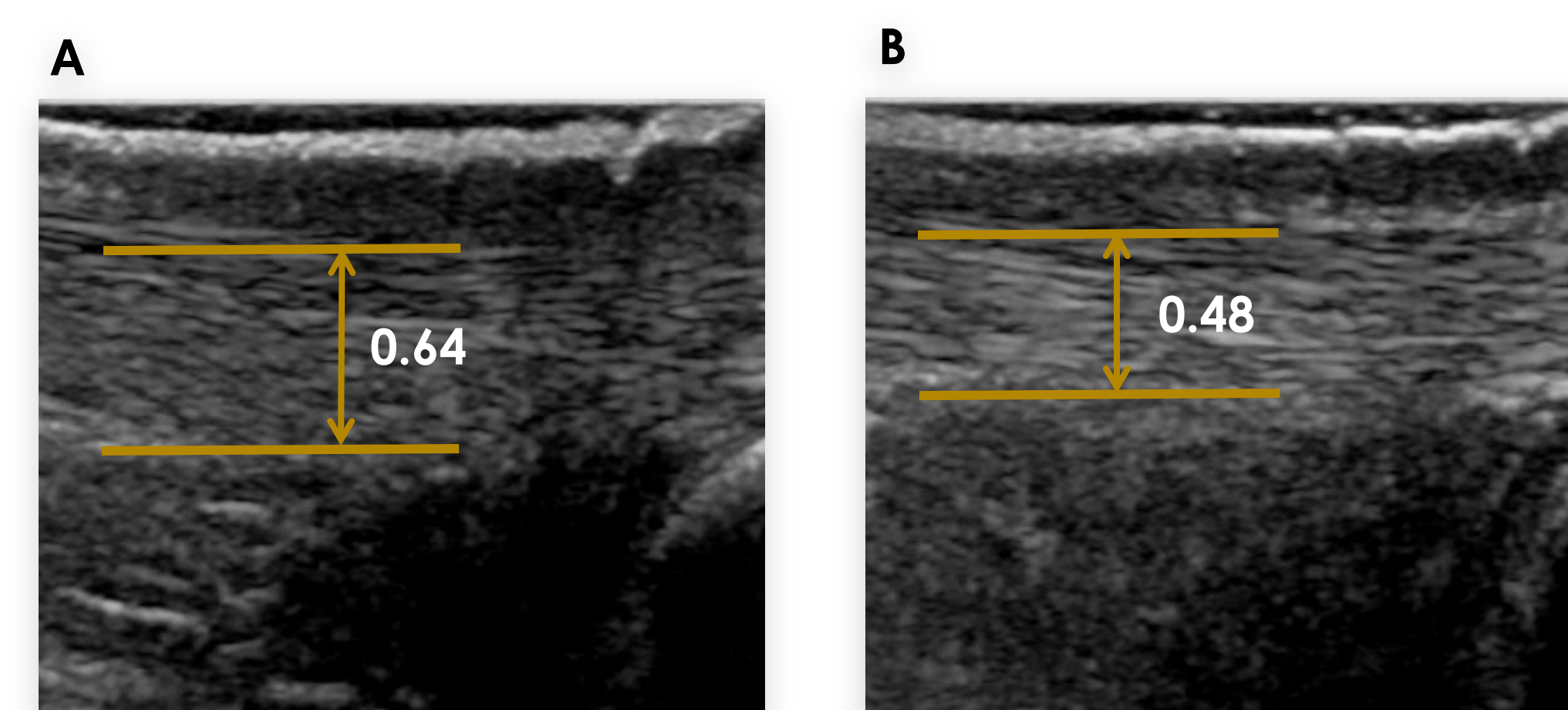
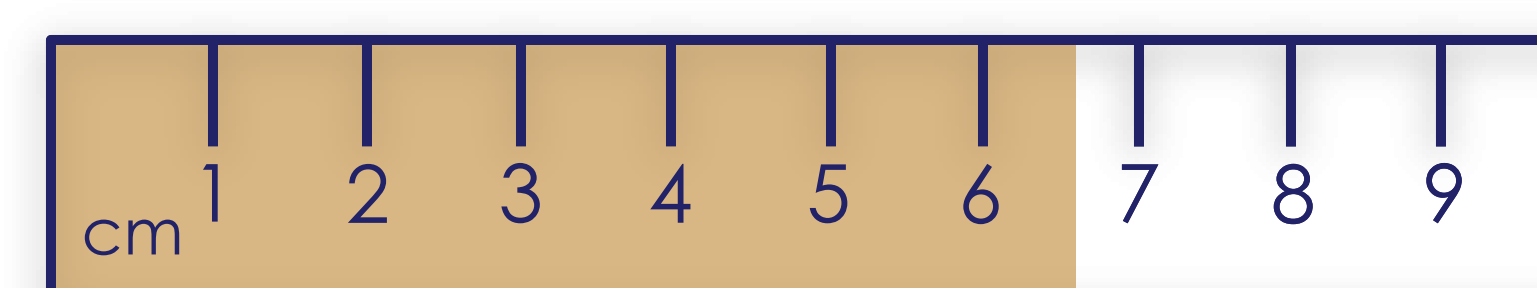


Tendon Thickness

Average Initial Tendon Thickness

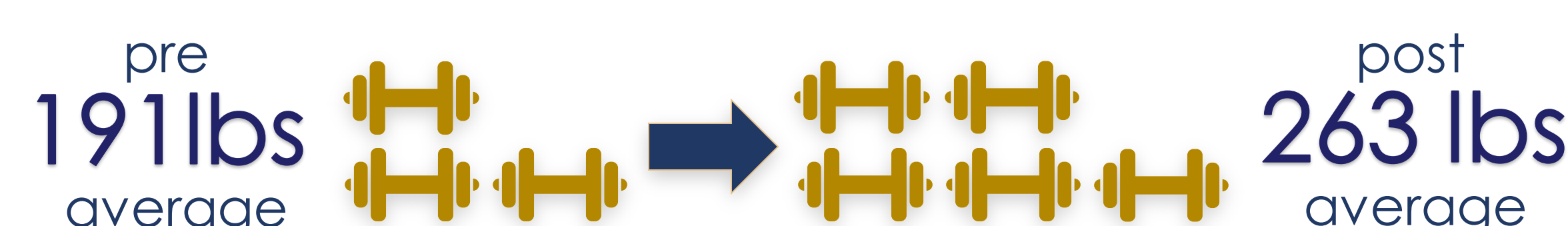


Average Post Tendon Thickness



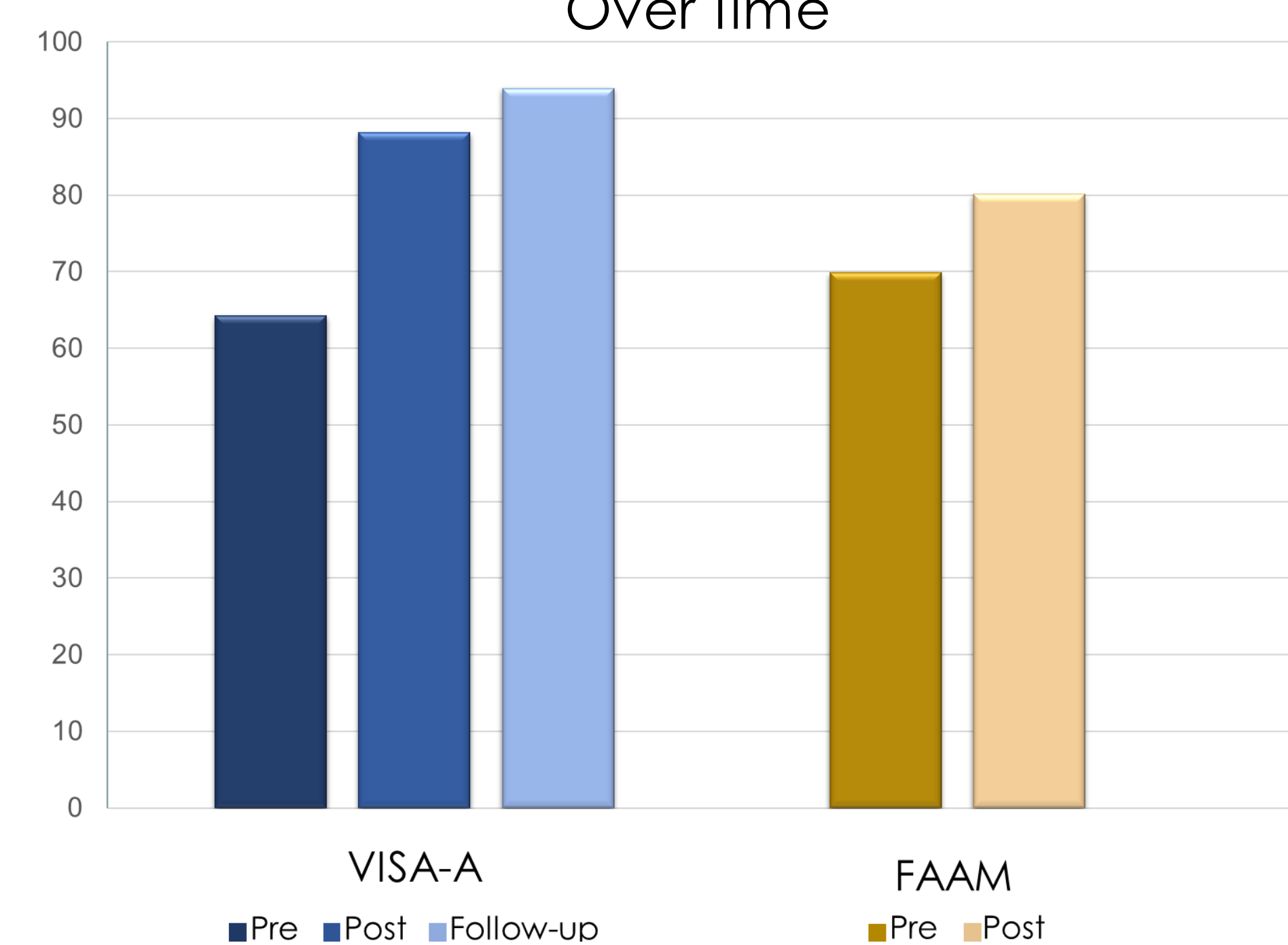
A: Longitudinal section of the middle 3rd of the Achilles tendon before exercise. B: Longitudinal section of the middle 3rd of the Achilles tendon after exercise.

Change in Load



Outcome Measures

Average Participant Reported Outcomes Over Time



Discussion

- Participants demonstrated decreased tendon thickness post-protocol which represents remodeling of the collagen fibers in the Achilles tendon.
- Heavy load eccentric exercise has been deemed superior to other AT protocols in demonstrating lasting effects in pain reduction and physical function.
- A future research suggestion is to increase the length of the study while performing a similar exercise program to determine if the tendon would further remodel, producing better results in tendon thickness and strength.
- Some limitations of our study included deficient supervision of participants' load progression, resulting in submaximal load progression. Additionally, the exercise equipment utilized varied between and among participants, which may have caused variations in load progression data.

Summary

Heavy Load Eccentrics:

- ✓ Increased Strength
- ✓ Decreased Pain
- ✓ Increased Function

References

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