

Comparative Analysis of the Effects of Ginger Almond Oil and Traditional Olive Oil on Muscle Elasticity and Stiffness During a Short Sports Massage Session

Mr LAU Chit Leung, Elvis, BSocSc (Hons) in Sports and Recreation Management
Department of Sport and Recreation
Supervisor: Dr LUK Tze Chung, Jim, Head of Department of Sport and Recreation
Mr HO Man Kit, Indy, Assistant Professor



Background

- ◆ **Insufficient muscle elasticity and heightened muscle stiffness** in the lower extremities are associated with an increased risk of musculoskeletal injuries. (Witvrouw et al., 2003)
- ◆ **Sports massage with oil application** is a common therapeutic method acknowledged for improving muscle elasticity and stiffness. (Kong et al., 2012)
- ◆ The Department of Food and Health Sciences (DFHS) has developed a **new mixing ginger almond oil (GAO)** designed for sports massage.

Objectives

- ▶ To investigate the **potential efficacy** of the new GAO on **muscle elasticity and stiffness** in the lower extremities.

Methodology

Formulation Trials

- ↓ Quasi-experimental
- ↓ Quantitative, Within-subjects

Recruitment of Participants

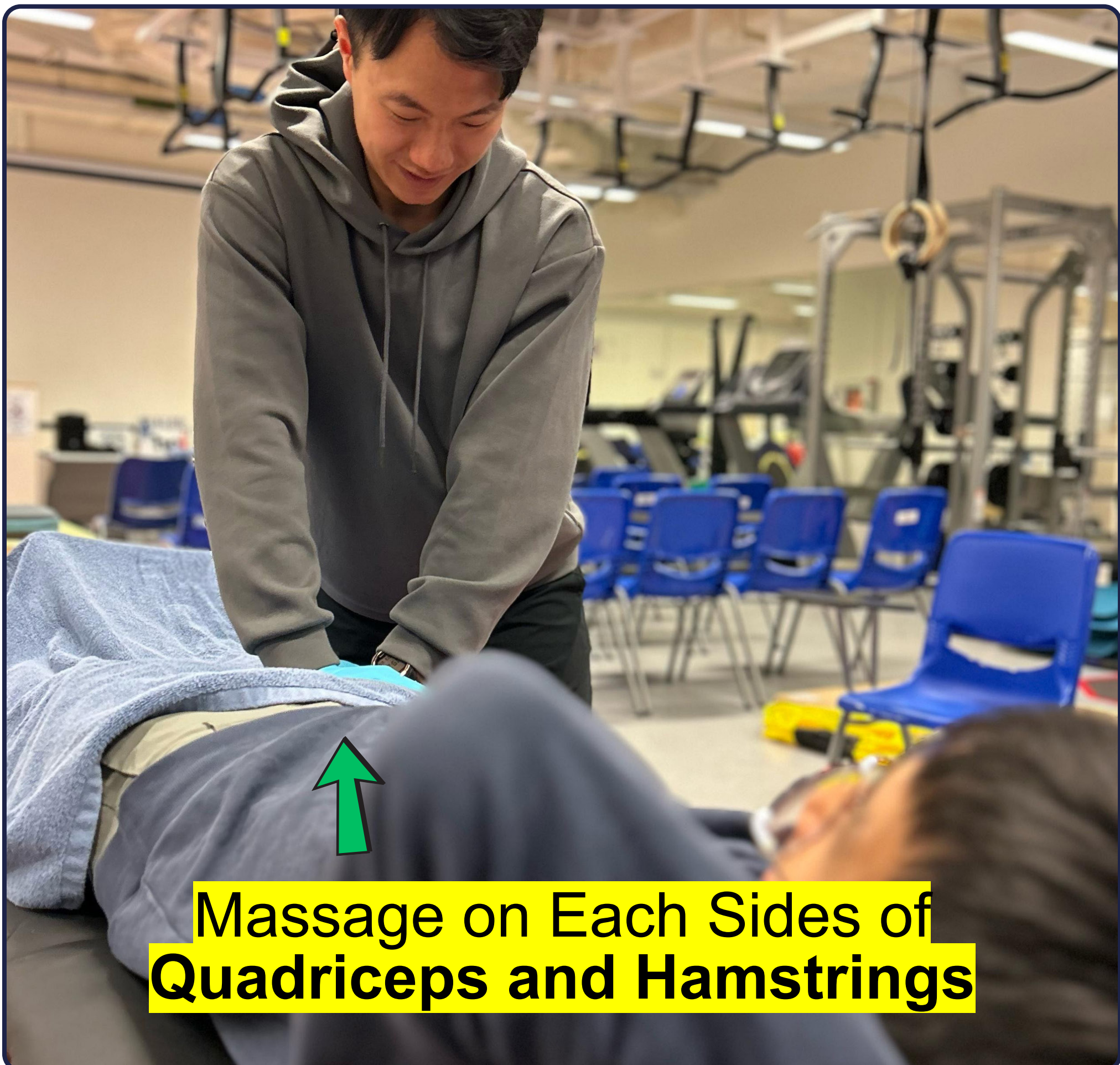
- ↓ 23 adults w/o skin allergy
- ↓ Aged from 18-40

Data Collection

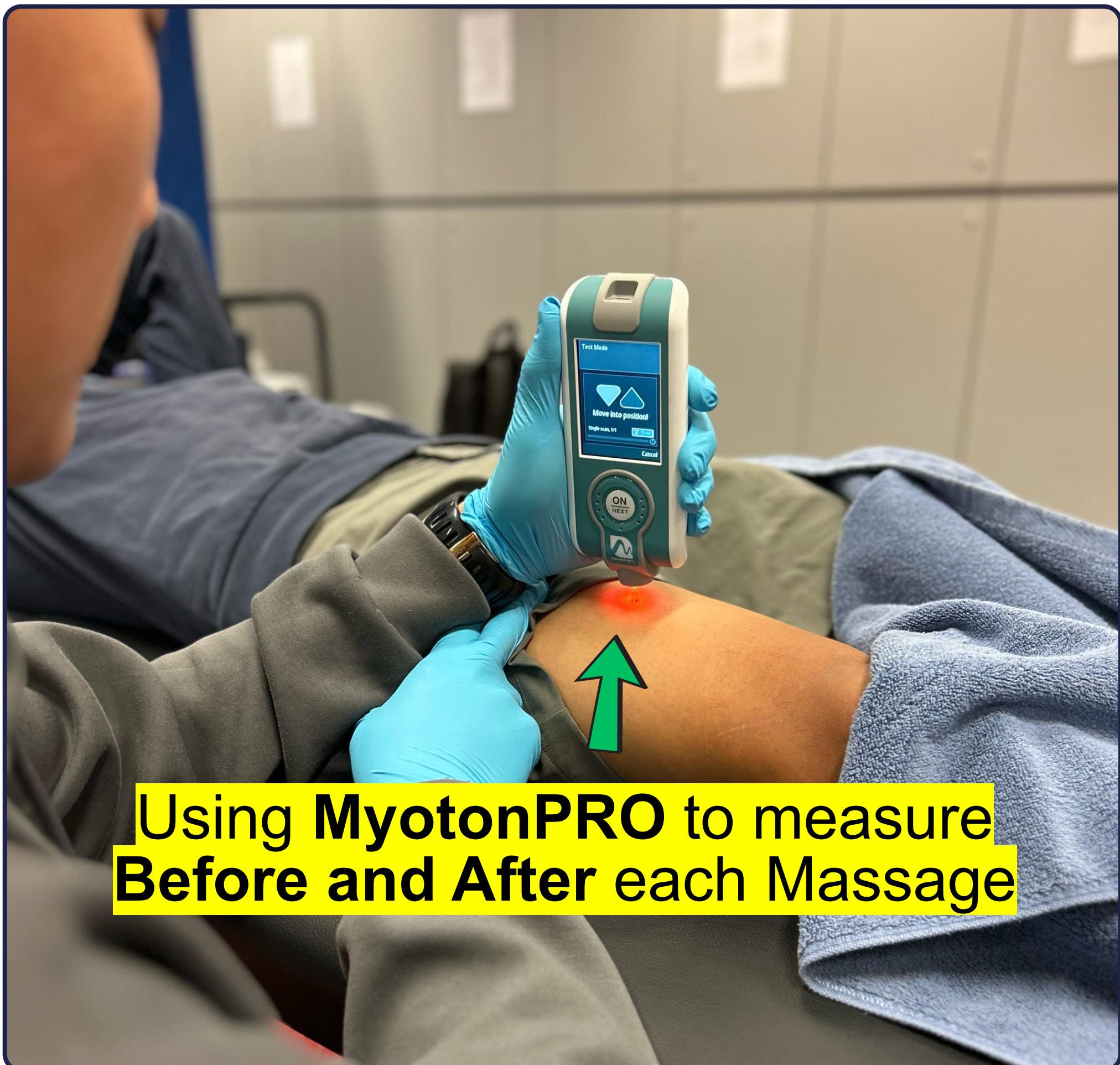
- ↓ Different Oil Interventions
- ↓ Specific Massage Protocol

Data Analysis

- One-way ANCOVA
- Post-hoc Test with Effect Size



Massage on Each Sides of
Quadriceps and Hamstrings



Using MyotonPRO to measure
Before and After each Massage

Findings

Table 1. One-Way ANCOVA for Post-Test Muscle Stiffness on Dominant Leg Hamstrings Across Interventions, Controlling for Pre-Test Muscle Stiffness on Dominant Leg Hamstrings

Source	df	F	Sig.	Partial Eta Squared
Interventions	2, 65	3.188	.048	.089 (Medium effect)

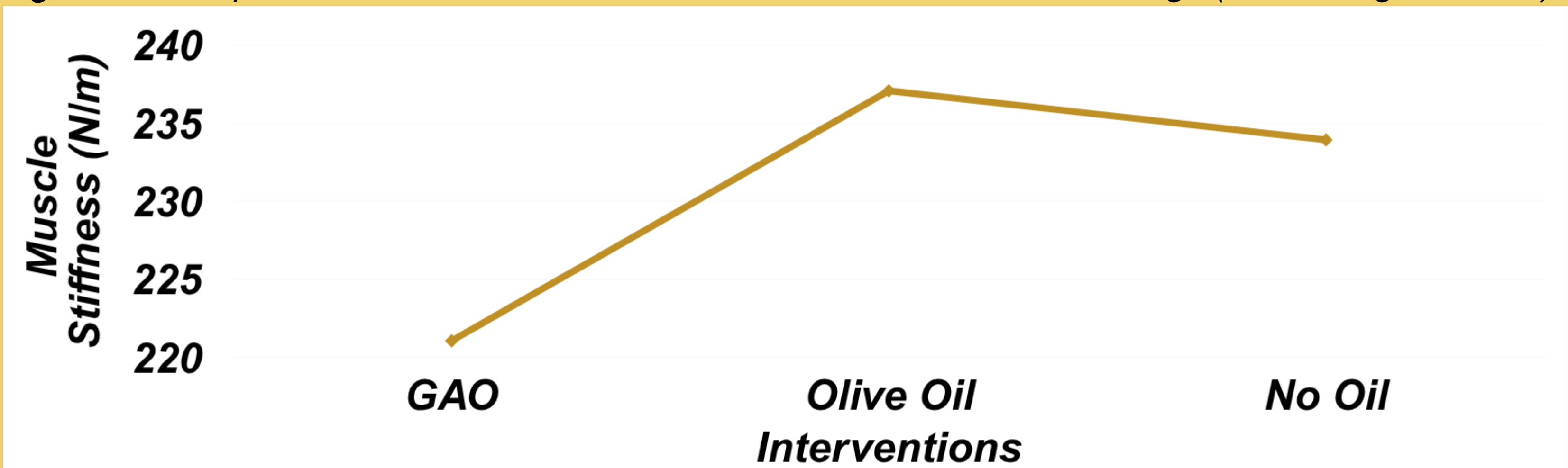
Table 2. Post-hoc Test with Cohen's d of Post-Test Muscle Stiffness on Dominant Leg Hamstrings

Intervention C	Intervention B	Mean Difference (C-B)	Std. Error	Sig.	Cohen's d
GAO (Ginger Almond Oil)	Olive Oil	-16.037	6.747	.020	3.35 (Large effect)

Table 3. Reliability and Precision of Post-Test Muscle Stiffness on Dominant Hamstrings

Intervention	CV%	SEM	MDC
GAO	5% (Conservative)	7.84 (3.5% of Mean Stiffness) (Excellent Precision)	21.7 N/m (SCIC: 22.1 N/m) (Reliable)

Figure 1. Comparison of Post-Test Muscle Stiffness in Dominant Hamstrings (Controlling Pre-Test)



- **Significant difference** in mean **muscle stiffness** reduction on dominant hamstrings [$F(2,65) = 3.188, p = .048, \eta p^2 = .089$] **between interventions.** (Table 1)
- **GAO significantly reduced** dominant hamstring stiffness ($M = -16.037, p = .02, d = 3.35$), compared to olive oil shown in Table 2 and Figure 1 while SEM and MDC revealed **excellent precision, statistically significant and clinically meaningful.** (Table 3)

Conclusion

- The application of the GAO is essential for **reducing muscle stiffness**, particularly in the **dominant hamstrings**, which **potentially prevents** excessive muscle stiffness.
- Therapeutic strategies should **prioritize compound synergy** over isolated anti-inflammatory properties.
- GAO may be utilized in **regular sports massage** as a **targeted preventive strategy** for general healthy population.