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The Effect of the Chirp Wheel and Other Ergogenic Aids on Back Flexion and Recovery



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Abstract

Foam rollers are used frequently as tools by health professionals and athletes to increase joint range of motion, tissue temperature, and blood flow, providing myofascial relief to areas targeted by the user (1). Standard foam rollers have been the subject of many studies, with very few regarding foam rolling of the spine, despite this technique being a common practice among athletes. The chirp wheel is a foam rolling product with a groove down the middle made to increase pressure on deep back muscles which may further decrease muscle tension and soreness while optimizing perceived recovery (2). To our knowledge, this is the first research study to test the effectiveness of the chirp wheel. Hope College football players were recruited to take part in this 3-week, 4-session counterbalanced study. Three sessions were conducted as players performed weightlifting regimens followed by structured recovery and sit and reach tests (5). Recovery treatments included the application of either a standard foam roller, chirp wheel, or yoga block to muscles in the gluteal, lumbar, thoracic, cervical, and full back regions (3). Additionally, in each session perceived relief was recorded after working out, post-treatment, and 24 hours after the session. The yoga block was used as a placebo to reduce expectancy error. It was hypothesized that the chirp wheel would provide the greatest increase in lumbar flexion and perceived relief, followed by the standard foam roller and yoga block conditions (4). Following data collection, the primary hypothesis was not supported, as there was no significant difference in sit and reach scores between baseline, chirp wheel, foam roller, or yoga block trials (34.2 ± 2.9 cm, 34.5 ± 3.8 cm, 34.2 ± 3.9 cm, and 33.1 ± 4.3 cm respectively, $p > 0.05$). The secondary hypothesis was similarly not supported as no significant difference was found in perceived relief 24 hours following chirp wheel, foam roller, or yoga block treatments (15.8 ± 1.5 , 15.8 ± 1.4 , 15.1 ± 1.2 , $p > 0.05$). This result indicates that company claims of long-lasting relief, regarding the 6-inch chirp wheel, would not be supported. Future research should focus on the use of the other Chirp wheel sizes. Furthermore, future research regarding back myofascial relief should be investigated, as there has yet to be adequate evidence of positive effects of back foam rolling, alone, on trunk flexion and perceived relief.

Introduction

Myofascial Release - gentle, sustained pressure on myofascial/connective tissue (1)

- relieve tension
- increase blood flow
- prevent or delay DOMS
- increase or restore range of motion
- Foam Rolling- method of self myofascial release that involves using one's own body weight to apply pressure on a cylindrical foam device

Chirp Wheel (2)

- Arrived on the market in 2015, premiered on Shark Tank
- "The Chirp Wheel is the only wheel on the market that is FDA-registered as a class-1 medical device"
- No previous research has been examined the Chirp Wheel in any capacity
- Chirp wheel company claims that 5 minutes of use will provide 'lasting relief'

Yoga Block

- A foam block was the sham condition which emphasized perception in the study in testing relief after using different rolling devices.

Subject-expectancy effect

- In research, a participant's expectation towards a specific outcome or result may unconsciously affect their response
- Why We chose this modality as a sham
- Capable of Applying pressure selectively to specific body regions
- Presents perception of recovery treatment

Purpose

Primary purpose

Evaluate the physiological effects of the chirp wheel and standard foam rolling devices on back flexion mobility utilizing a sit and reach test

Secondary purpose

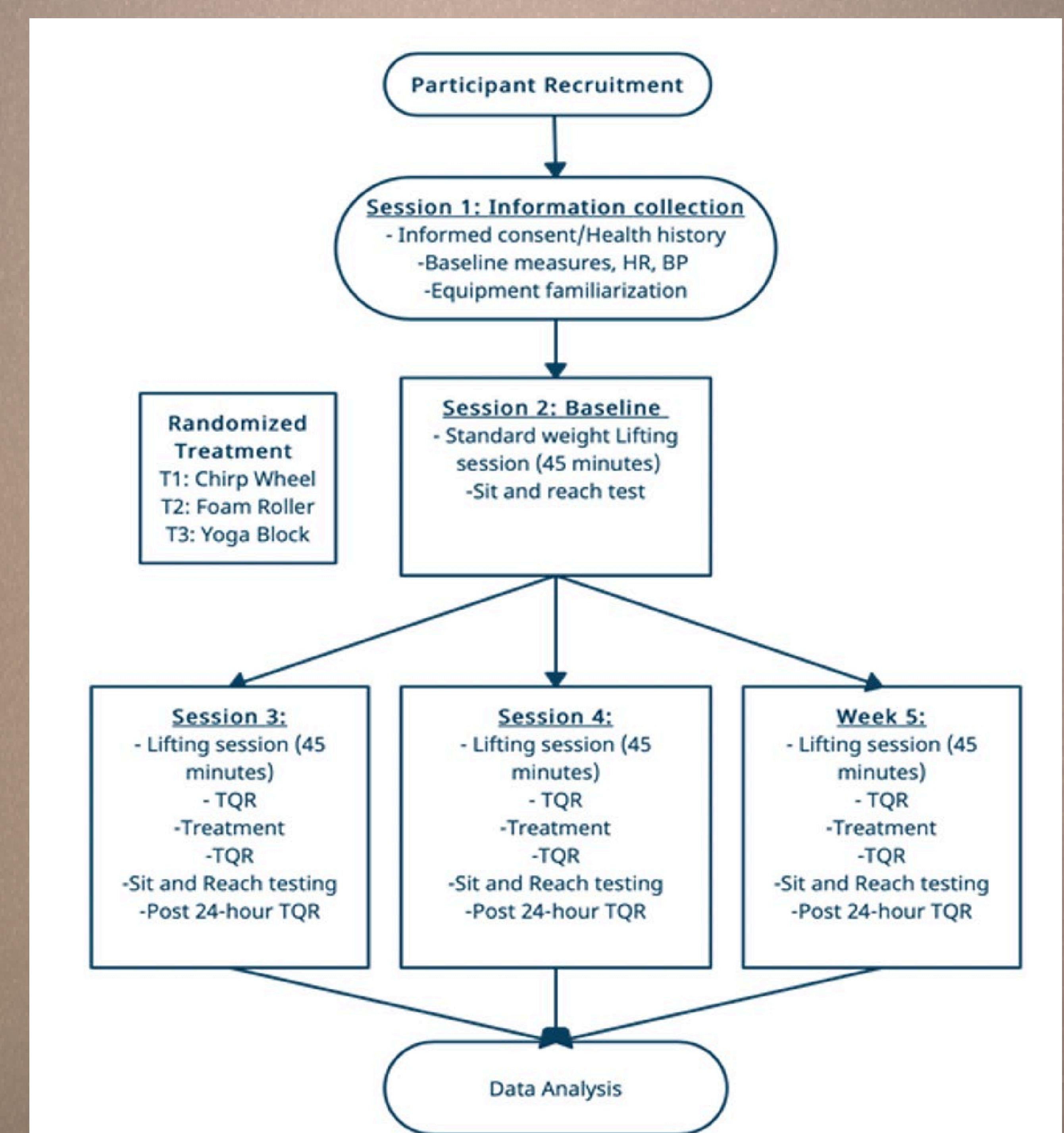
Evaluate perceived relief through a total quality recovery questionnaire

Chirp wheel ➔ greatest increase in lumbar flexion
Followed by the standard foam roller and yoga block conditions

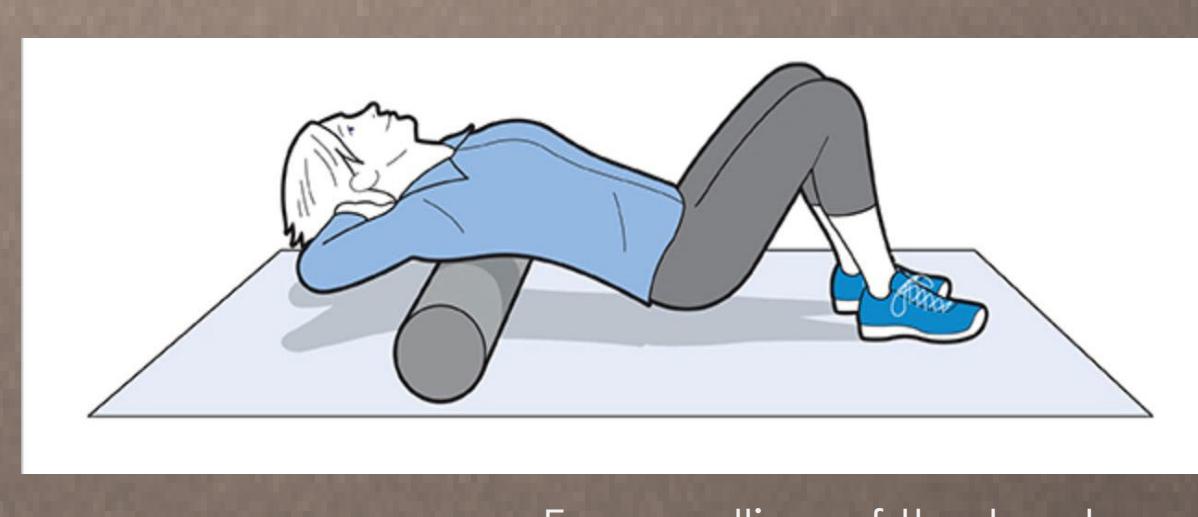
Chirp wheel ➔ greatest increase in perceived relief
Followed by the standard foam roller and yoga block conditions

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Sit and reach test for flexion of the spine



Foam rolling of the back

Methods

- 13 subjects (ages 18-22) recruited from the Hope College Football team
- Pre-testing: blood pressure, height, weight, body composition
- Baseline- sit and reach test
- 3 randomly counterbalanced treatments
 - Chirp wheel, foam roller, yoga block (sham)
- After treatment: sit and reach (5), TQR score (4)
- TQR taken post-workout, post-treatment, and 24-hours after treatment

Treatment Protocol

- Six minutes
- Each cycle consisted of 30 seconds of application followed by 10 seconds of rest for targeted muscle groups
- Left & right glutes, lumbar, thoracic, cervical spine, and full-back

Total quality recovery (TQR)
6
7 Very, very poor recovery
8
9 Very poor recovery
10
11 Poor recovery
12
13 Reasonable recovery
14
15 Good recovery
16
17 Very good recovery
18
19 Very, very good recovery
20

Results

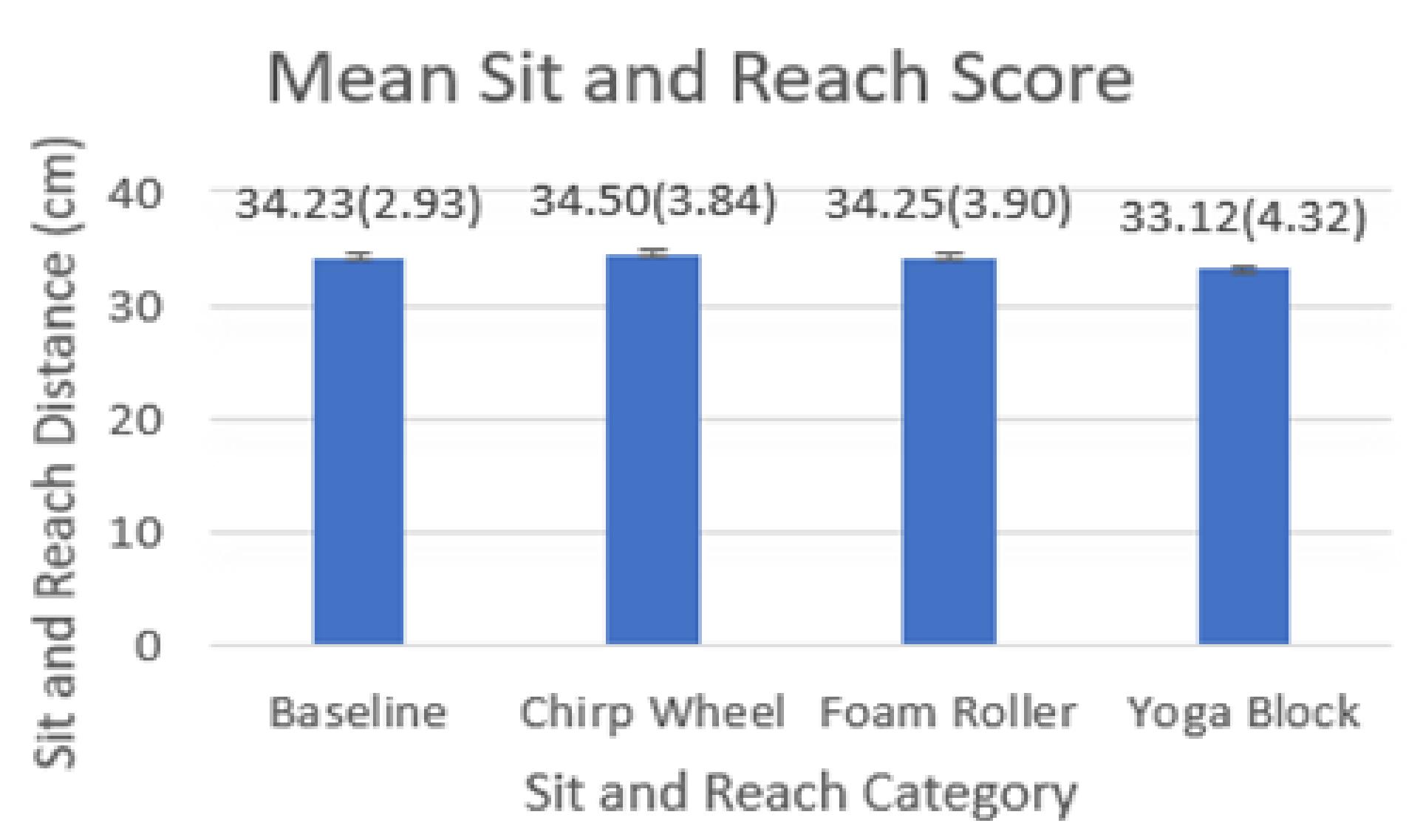


Figure 1. Mean sit and reach score measures associated with categories of baseline, chirp wheel, foam roller, and yoga block flexibility assessments.

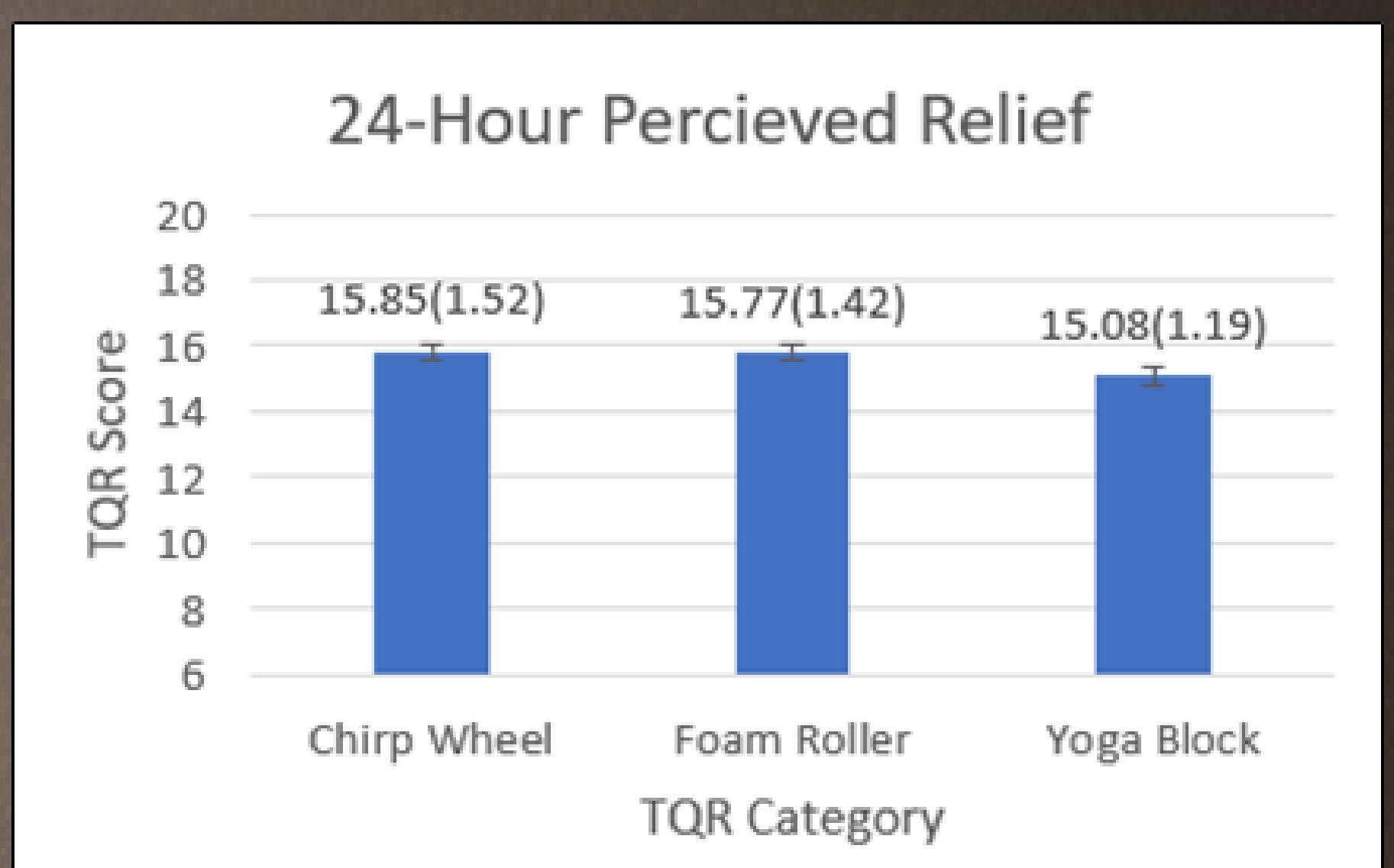


Figure 2. Mean total quality recovery scores 24 hours after treatment, indicating long-lasting relief, associated with categories of chirp wheel, foam roller, and yoga block treatments.

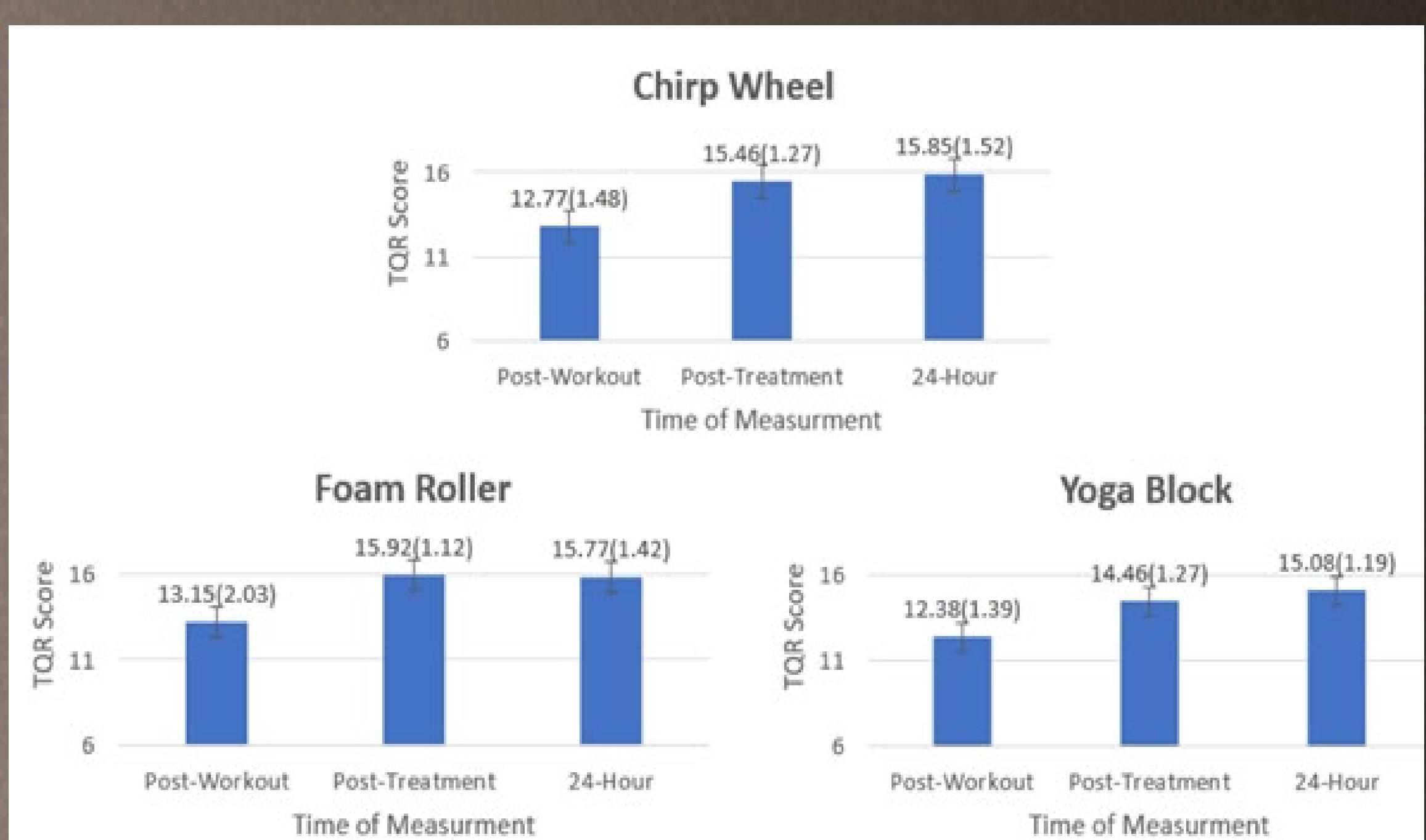


Figure 3. Mean total quality recovery scores post workout, post treatment, and 24 hours after treatment associated with chirp wheel, foam roller, and yoga block treatments.

Conclusions

- There was no significant difference in sit and reach scores across baseline or treatment type.
- There was no significant difference in perceived relief 24-hours when comparing each of the treatments.
- Mean Perceived relief scores improved over time for all conditions, though not differently from one another.

Limitations

- Number of Participants
- Variation in body measures
- Mask wearing populations
- Failure to accurately match rolling cadence
- Inability to control for behaviors outside of the study

Implications

- The results do not support company claims that 5 minutes of use of the Chirp wheel will provide "lasting relief."
- Future recovery tools are needed specifically for the back
- 10" and 12" Chirp wheels should be examined similarly