

# FLYWHEEL VS PNEUMATICS »»



# The question.

Do two gravity independent forms of resistance training such as flywheel (FRT) and pneumatic resistance (PRT) produce similar adaptations to muscle structure and function?



A black and white photograph showing a hand holding a handball. The hand is positioned on the right side of the frame, with fingers wrapped around the ball. The ball is in the center, and a goal net is visible in the background, slightly out of focus. The overall scene is set against a dark background.

# Background

Handball demands considerable physical conditioning for elite-level play. High levels of running velocity, throwing velocity, muscle power and maximum strength have been determined as the main contributors to performance.

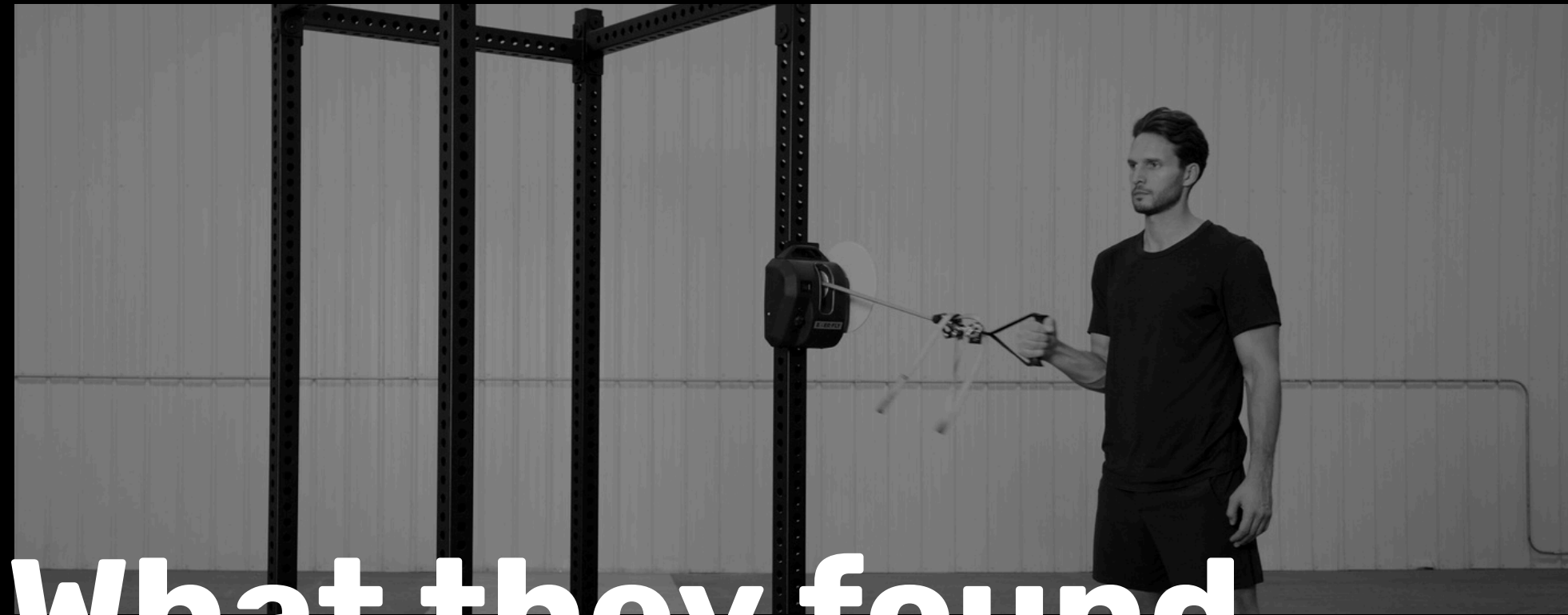


A black and white photograph of three handball players in action. One player in the center is jumping high, holding a handball above his head with both hands. Two other players are positioned below him, one on the left and one on the right, both reaching up towards the ball. The background is a blurred indoor sports arena.

# Purpose of study

The aim of this study (Maroto et al. 2022) therefore was to determine the effects of two gravity independent training modalities, FRT and PRT, on muscle structure and function in handball players.





# What they found

What they found was that similar improvements were noted in the strength, power and throwing velocity measures, with no between group differences, however, FRT resulted in significantly greater hypertrophy of the anterior and middle deltoid (20 and 22%) in comparison to PRT (14 and 7%, respectively).



A black and white photograph showing a person's feet on a flywheel exercise machine. The machine has a large flywheel with the brand name 'EXER-FLY' and 'INERTIA' visible. The person is wearing dark sneakers. The machine is on a tiled floor.

# Take home messages

The researchers concluded that FRT appears better to increase muscle size and this may be attributed to the eccentric overload it provides.

Maroto-Izquierdo, S., McBride, J. M., Gonzalez-Diez, N., García-López, D., González-Gallego, J., & de Paz, J. A. (2022). Comparison of flywheel and pneumatic training on hypertrophy, strength, and power in professional handball players. *Research Quarterly for Exercise and Sport*, 93(1), 1-15.

