RAPID RESEARCH

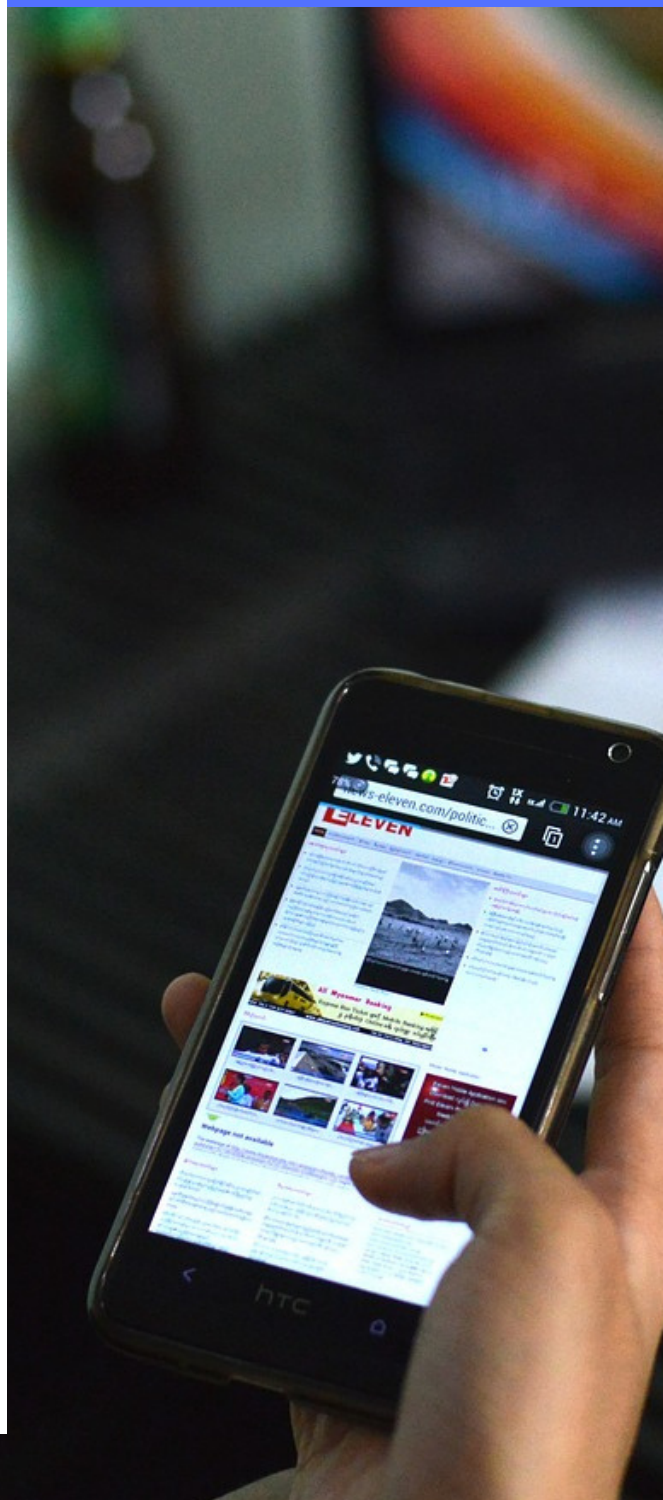
@physicaltherapyresearch

March 2022

Inside This Week:

Breathing for Health & Performance

- Effects of Slow Breathing on Blood Pressure
- Effects of Inspiratory Muscle Warm Up on V02 Output.
- Respiratory Muscle Training for Running Performance



MARCH 2022

EFFECTS OF SLOW BREATHING ON BLOOD PRESSURE

Click for Full Text (Li et al 2018)

This study investigated the effects of slow breathing rate on heart rate variability and arterial baroreflex sensitivity, the most powerful system regulating blood pressure.

KEY FINDINGS

60 patients with high blood pressure (HBP) & 60 healthy controls.

All completed controlled breathing at **8(slow) and 16(fast) breaths/min for 5 minutes, 2 times.**

Tested whether slow breathing was capable of modifying baroreflex sensitivity, in people with HBP.

Slow (8/min) v. Fast (16/min):
Decreased heart rate and blood pressure
Shifted respiratory peak toward left
Increased Low Frequency(LF) power and LF/HF ratio
Decreased High Frequency power

Resting baroreflex **sensitivity decreased in hypertensive subjects.**

MAIN TAKEAWAYS

Slow respiration (8 breaths/min) can **increase HF power and decrease LF power and LF/HF ratio** in essential hypertension.

Slow breathing showed the potential to be a **simple and inexpensive method to improve autonomic balance and increase the baroreflex sensitivity** in hypertensive patients.

This opens a new area of future research in the **better management of patients with essential hypertension.**

MARCH 2022

EFFECTS OF INSPIRATORY MUSCLE WARM UP ON V02 OUTPUT.

Click for Full Text (Arend et al. 2021

This study investigated the effect of an inspiratory muscle warm-up on the VO2 kinetics during sub-maximal intensity ergometer rowing

KEY FINDINGS

10 competitive male rowers took part.

Sub-maximal constant (90% PVO2max) rowing test to failure
Test 1: Standard rowing warm up
Test 2: Standard warm up + inspiratory muscle warm-up

- 2x30 repetitions at 40% maximal inspiratory pressure.

Significant **correlation found between time constant and the VO2 value at 400 s in Test 1**

No correlation was found between those parameters in Test 2.

A **positive association between VO2max from the incremental rowing test and τ1 from Test 1**, whereas VO2 did not correlate with τ1 from Test 2.

MAIN TAKEAWAYS

Additional inspiratory muscle warm-up **had no significant effect on oxygen consumption fast or slow** component kinetics during 90% PVO2max intensity rowing tests.

Adding the specific inspiration muscle warm-up at the intensity of 40% MIP to traditional rowing warm-up **does not have any significant advantage in practice.**

MARCH 2022

RESPIRATORY MUSCLE TRAINING (RMET) FOR RUNNING PERFORMANCE

Click for Full Text (Keisho et al. 2021)

This study evaluated respiratory muscle endurance and cardiovascular response during hyperpnoea and whole-body running performance before and after RMET in normoxia and hypoxia.

KEY FINDINGS

21 collegiate endurance runners:
Control (n = 7) | Normoxic (n = 7) | Hypoxic (n = 7)
Constant exercise test on treadmill at 95% (VO2peak).

Respiratory muscle endurance was **increased after RMET in the normoxic and hypoxic groups.**

The time to exhaustion at 95% VO2peak exercise also increased after RMET in the normoxic and hypoxic groups, but not in the control group.

The magnitude of these changes did not differ between the normoxic and the hypoxic groups.

MAIN TAKEAWAYS

Respiratory muscle endurance could **improve and blunt respiratory muscle metaboreflex** after RMET in endurance-trained runners.

This could contribute to **improvement in whole-body exercise performance.**

However, it is also suggested that there are **no additional effects when RMET is performed under hypoxic conditions.**

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