



Reliability of Zephyr BioHarness Reliability Respiratory Rate at rest, during the Modified Canadian Aerobic Fitness Test and Recovery

We wanted to know if the Zephyr BioHarness would provide reliable breathing rates when worn by males and females of different ages while doing a fitness test.



What is the problem?

The Zephyr BioHarness is a device (worn on the chest) that captures physiological responses such as heart rate, breathing rate, posture and activity. Before the Zephyr BioHarness can be used in research studies or in a real-world setting, we need to test and determine if the device can produce consistent results (reliability) when used over time. The results from previous Zephyr BioHarness studies cannot be generalized to everyone because they only tested small groups of people. We wanted to know if the Zephyr BioHarness would capture breathing rates reliably when worn by males and females of different ages while resting (sitting) and doing a fitness test.

How did the team study the problem?

A group of 60 healthy participants (30 females, 30 males) across various age groups (range = 20 – 68 years) wore the Zephyr BioHarness so we could monitor their breathing rate while they were sitting (rest and recovery) and performing the Modified Canadian Aerobic Fitness Test. We used statistical analyses to test whether the breathing rate measures were consistent over time.

What did the team find?

We found that the Zephyr BioHarness' measures of breathing rate were consistent while the participants were resting, performing the fitness test, and recovering from the fitness test. Overall, the Zephyr BioHarness showed excellent reliability for breathing rate measures.

How can this research be used?

The FIREWELL team will use the Zephyr BioHarness to monitor firefighters' breathing rate while they perform firefighting tasks and explore differences in breathing rate responses based on individual factors such as gender, sex, or age. Other researchers may use the Zephyr BioHarness in the same way. Fire services can use the Zephyr BioHarness to help keep firefighters safe by tracking their physical status during training and real fire situations.

Cautions

We tested the Zephyr BioHarness in healthy participants that were not firefighters. We are working on research to test on firefighters to see if we get similar results.

Reference: Nazari G, MacDermid JC. Reliability of Zephyr Bioharness Respiratory Rate at rest, during the Modified Canadian Aerobic Fitness Test and Recovery. J Strength Cond Res. 2019 Jan 23. [Epub ahead of print]

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