



# The Effects of Body Weight Assistance On Maximal Aerobic Capacity In College Age Women

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## Introduction

Maximal oxygen consumption, or  $VO_{2max}$  is the maximal capacity for the body to deliver and utilize oxygen during an intense exercise.  $VO_{2max}$  can be expressed as an absolute value in liters of oxygen per minute (L/min) or in a relative value as milliliters of oxygen per kilogram of body weight per minute (ml/kg/min). Body weight assistance (BWA) is often used within the rehabilitation setting as a reliable resource to provide patients the ability to perform a walking motion at a reduced body weight. The AlterG Anti-Gravity Treadmill utilizes the Differential Air Pressure technology to alleviate the individual's weight. Research has shown that BWA in the form of gait harness and water immersion reduces the metabolic work of the patient while the AlterG yields varying results.

## Purpose

The purpose of this study was to determine if 20% BWA in the form of the AlterG Anti-Gravity Treadmill had an effect on the  $VO_{2max}$  values of college-aged women.



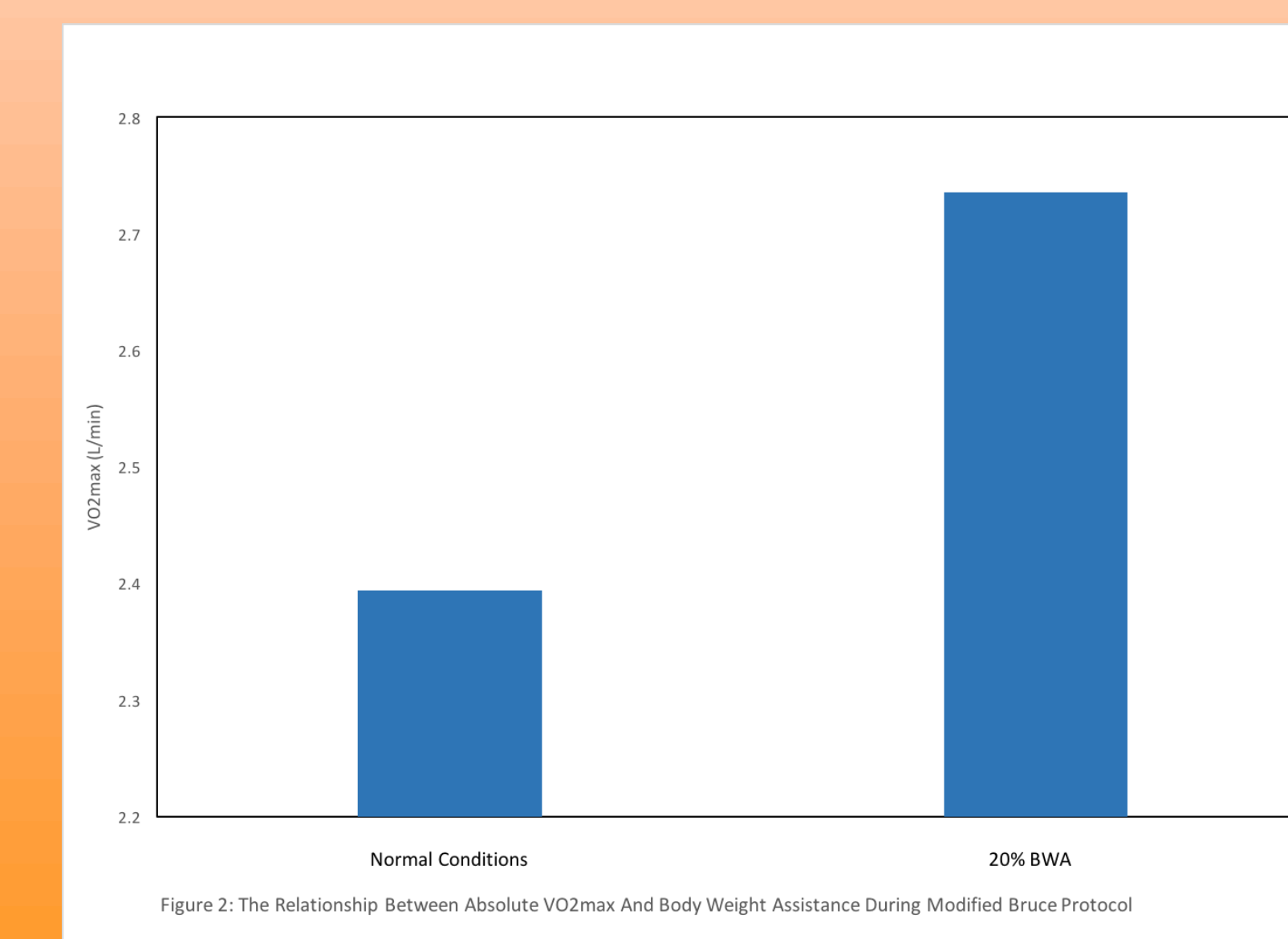
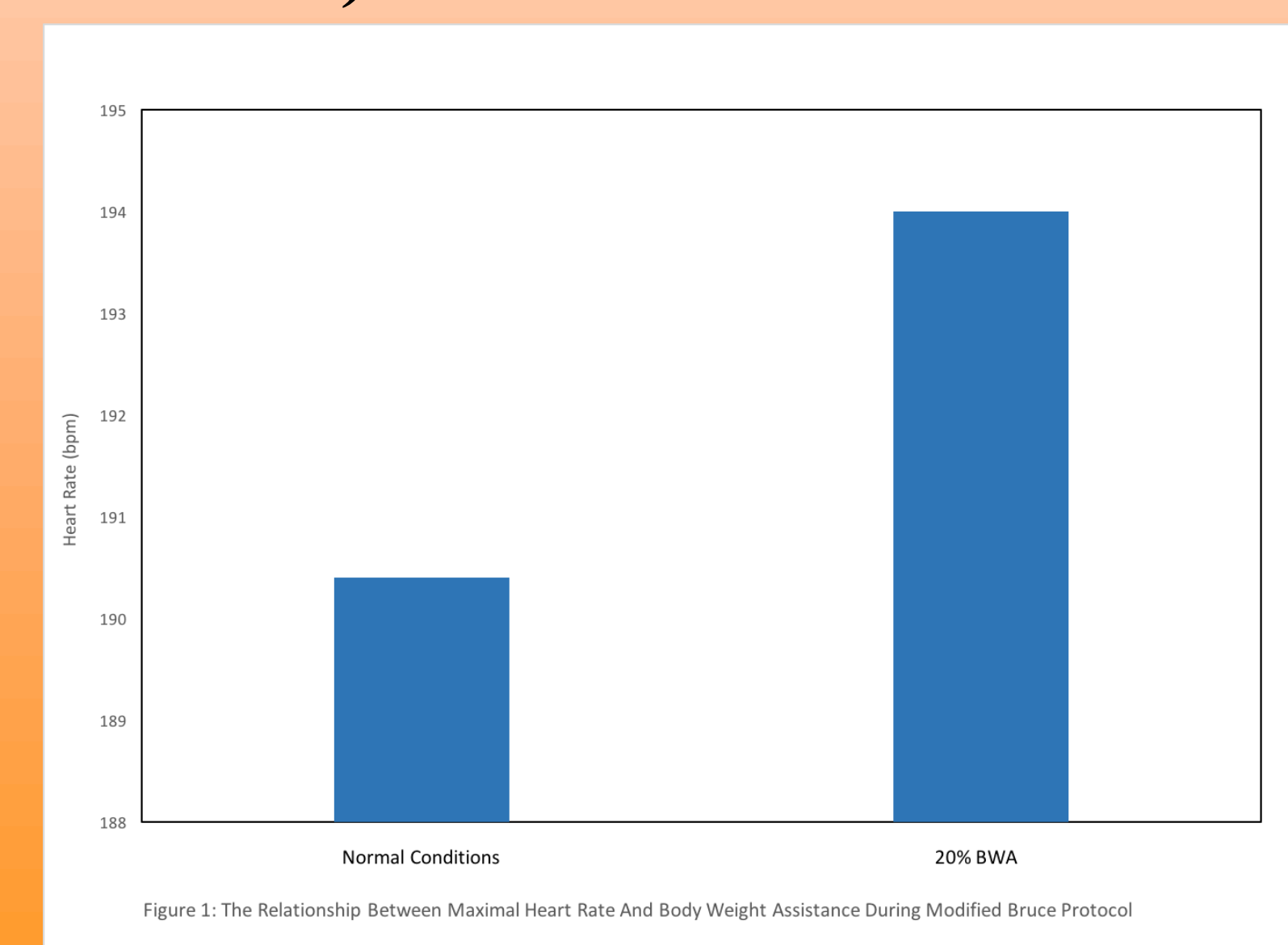
## Methods

Five women (age  $20.2 \pm 2.28$  years) of the University of Texas at Arlington, volunteered to participate in this study. Each subject performed a graded exercise test on the AlterG with increasing speed and elevation until exhaustion. Subjects were asked to perform this test twice, exactly one week apart under normal body weight conditions (NC) and under 20% BWA. Subjects were unaware of the conditions while testing and the trials varied from subject to subject to prevent a pre-exposure learning curve. During each test, heart rate (HR) was obtained every minute while blood pressure (BP) and rate of perceived exertion (RPE) was obtained every 3 minutes. Minute ventilation ( $V_E$ ) and oxygen consumption ( $VO_2$ ) was measured continuously throughout the test by the portable metabolic system K4b2 and maximal values were recorded

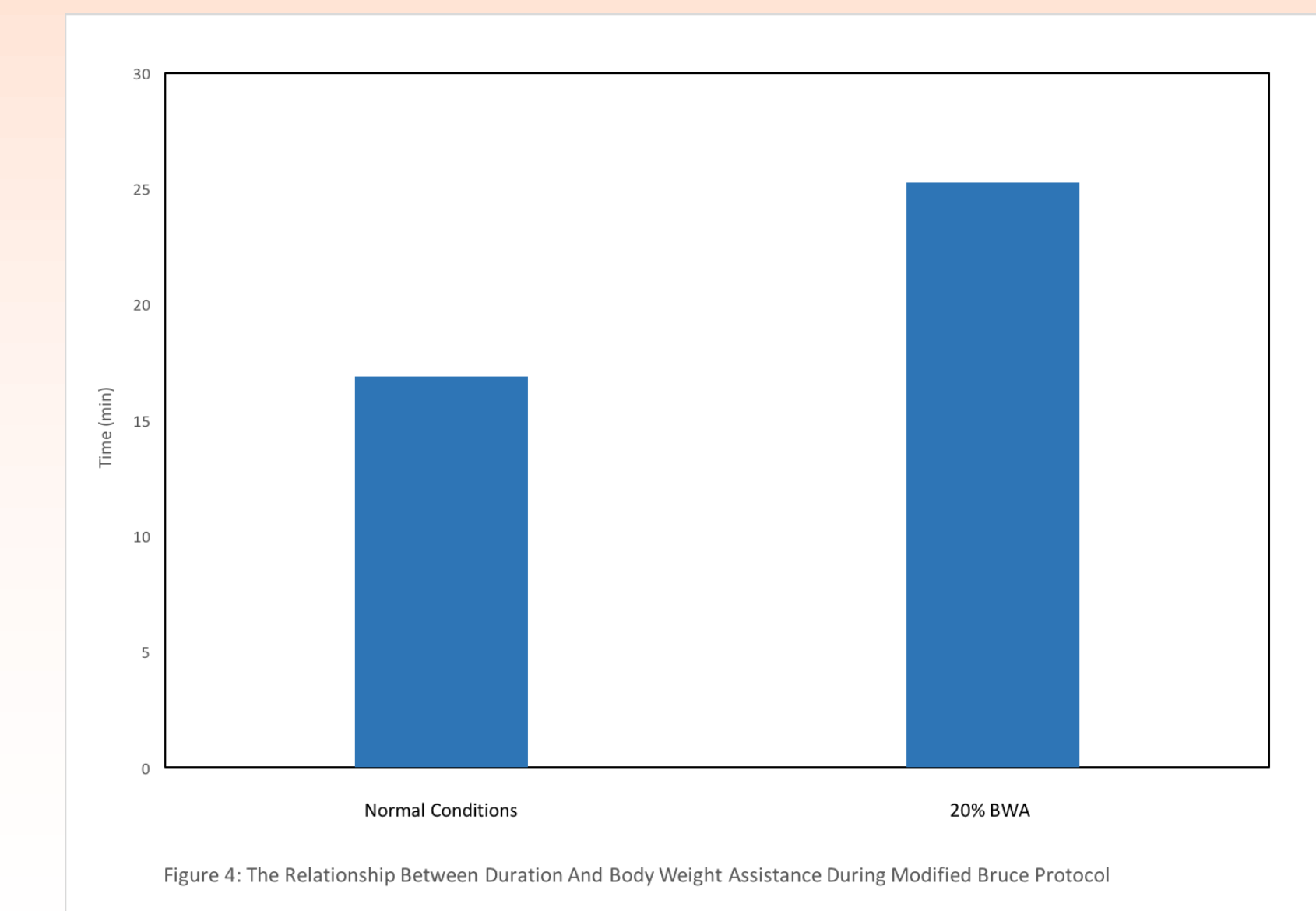
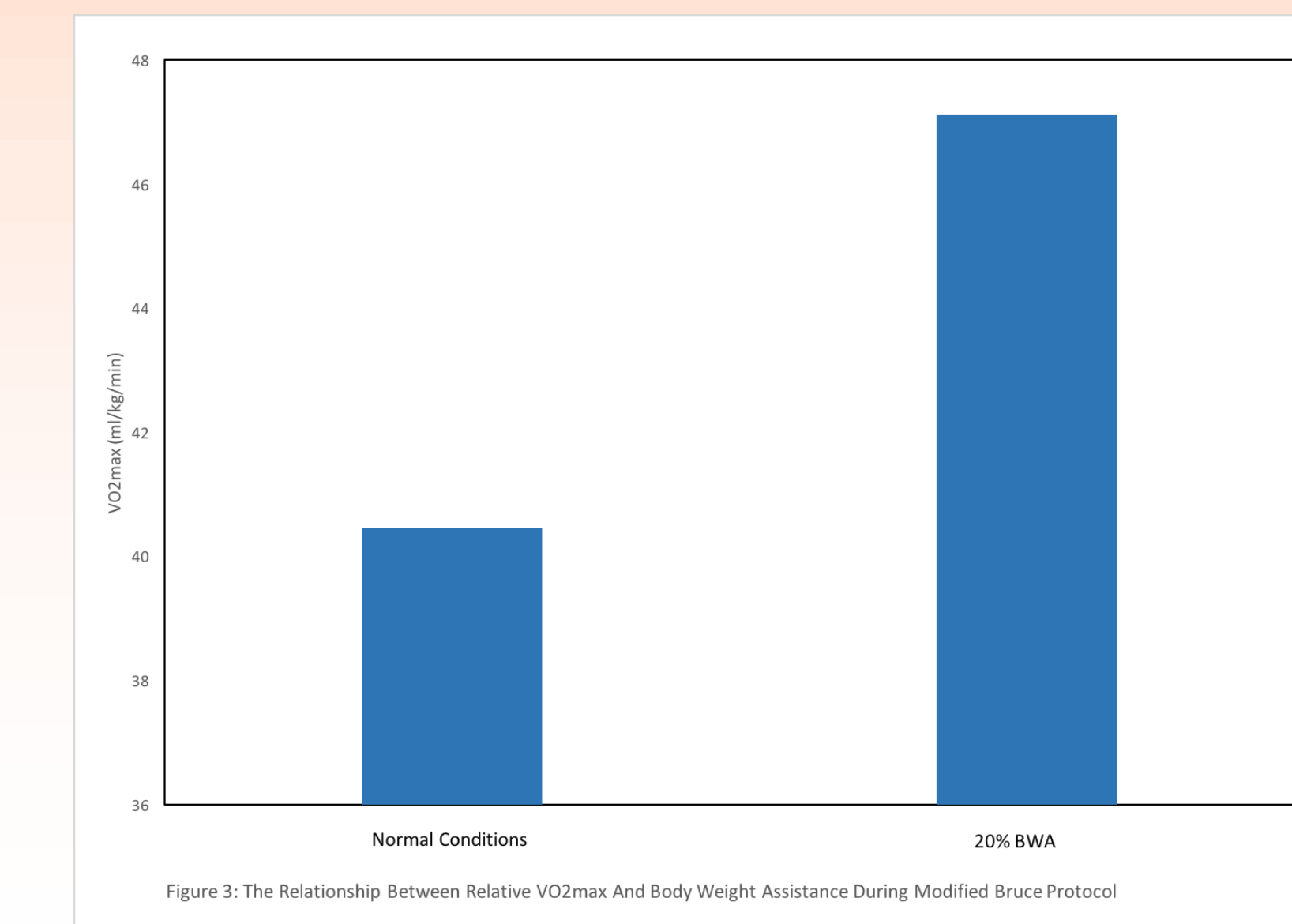
Age (years)	Height (inches)	Weight (kg)	BMI (kg/m <sup>2</sup> )
$20.2 \pm 2.28$	$65.4 \pm 2.97$	$59.62 \pm 11.15$	$22.25 \pm 3.26$

## Results

The maximal values: HR (NC:  $190.4 \pm 10.83$  bpm; 20% BWA:  $194 \pm 6.67$  bpm); RPE (NC:  $14.4 \pm 3.36$ ; 20% BWA:  $14.8 \pm 5.02$ ); absolute  $VO_{2max}$  (NC:  $2.39 \pm 0.57$  L/min; 20% BWA:  $2.74 \pm 0.14$  L/min); relative  $VO_{2max}$  (NC:  $40.46 \pm 9.15$  ml/kg/min; 20% BWA:  $47.12 \pm 8.50$  ml/kg/min) did not result in a significant difference ( $p > 0.05$ ). Although maximal time approached a significant difference (NC:  $16.91 \pm 3.74$  min; 20% BWA:  $25.26 \pm 6.64$  min), it did not meet the requirements ( $p = 0.072$ ).



## Results (cont'd)



## Conclusions

The results of this study indicate that 20% BWA did not result in a significant difference in HR, RPE, absolute and relative  $VO_{2max}$ , and time. However, subjects under body weight assistance did run for nearly 8 minutes longer than under normal conditions.

