



INTENSITY LEVEL OF MEN'S COLLEGIATE BASKETBALL PLAYERS DURING SCRIMMAGE

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Abstract

INTRODUCTION: Maximal oxygen consumption (VO_{2max}) is the maximum capacity of the body to transport and utilize oxygen during incremental exercise. It is expressed either as an absolute rate in liters of oxygen per minute (L/min) or as a relative rate in milliliters of oxygen per kilogram of body weight per minute (ml/kg/min). The vector magnitude is the measurement of physical activity (accelerometer counts/min) which can provide a measure of movement during activity and is assessed with an accelerometer. Previous research has shown that maximal oxygen consumption and vector magnitude are both indicative of intensity level of physical activity.

PURPOSE: The purpose of this study was to evaluate the intensity level, expressed as a percentage of VO_{2max} , that collegiate men basketball players performed during scrimmage.

METHODS: Five men (age 20.2 ± 1.1 yrs) of the UTA men's basketball team volunteered to participate in this study. Each subject's height, weight, resting heart rate (RHR), and blood pressure was measured for baseline measurements. Each subject performed a graded exercise test on the treadmill with increasing speed and elevation until exhaustion, using the Parvo metabolic cart to collect expired gases. During each test heart rate (HR) was recorded every minute and rate of perceived exertion (RPE) was recorded every three minutes. Values obtained from the metabolic cart included: Kcals, absolute maximal oxygen consumption (L/min), and relative maximal oxygen consumption (ml/kg/min).

RESULTS: The height and weight of the participants were 73.6 ± 2.9 in and 186.2 ± 13.7 lbs, respectively. The maximal values: maximal heart rate (MHR) 189.2 ± 5.0 bpm; RPE M: 17.8 ± 0.8 ; relative VO_{2max} 50.2 ± 1.0 ml/kg/min; kcal at max 147.8 ± 7.2 kcals. Based on the heart rates taken during the max testing and the average heart rate during scrimmage the players were able to play at an average of 74.8% HRmax, and, at times, reach peak heart rates that were 91% HRmax. In addition, there was a significant correlation found between the average vector magnitude and relative VO_{2max} ($r=0.92$) and also between the peak vector magnitude and relative VO_{2max} $r=0.88$.

CONCLUSION: The results of this study indicate that those who compete in competitive sports maintain a high level of intensity even during practice.

Purpose

The purpose of this study was to evaluate the intensity level, expressed as a percentage of VO_{2max} , that collegiate men basketball players performed during scrimmage.

Methods

- Five men of the UTA men's basketball team volunteered to participate in this study.

Age	Height	Weight
20.2 ± 1.1 yrs	73.6 ± 2.9 in	186.2 ± 13.7 lbs

Maximal Aerobic Treadmill Test

- Each participant's resting heart rate (RHR) and blood pressure was measured for baseline measurements.
- The treadmill speed and elevation were increased until exhaustion, using the Parvo metabolic cart to collect expired gases.
- Heart rate (HR) was recorded every minute and rate of perceived exertion (RPE) was recorded every three minutes.
- Values obtained from the metabolic cart included: Kcals, absolute maximal oxygen consumption (L/min), and relative maximal oxygen consumption (ml/kg/min).

Methods (cont'd)

- Scrimmage
 - Each participant wore a HR monitor around the chest and an accelerometer on their waistband.
 - The subjects wore both for approximately fifty-four minutes to obtain the submaximal exercise data.

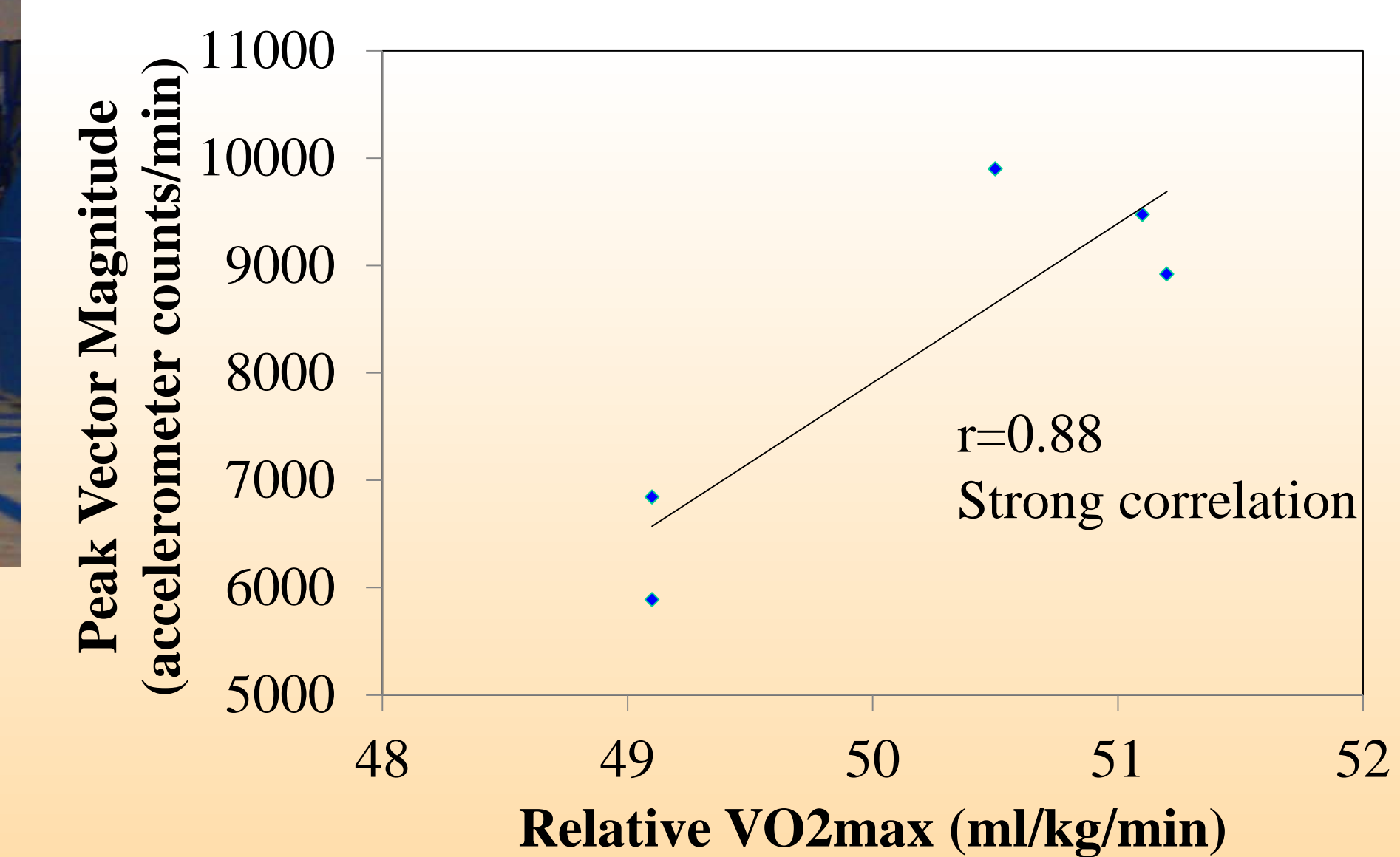


Results (cont'd)

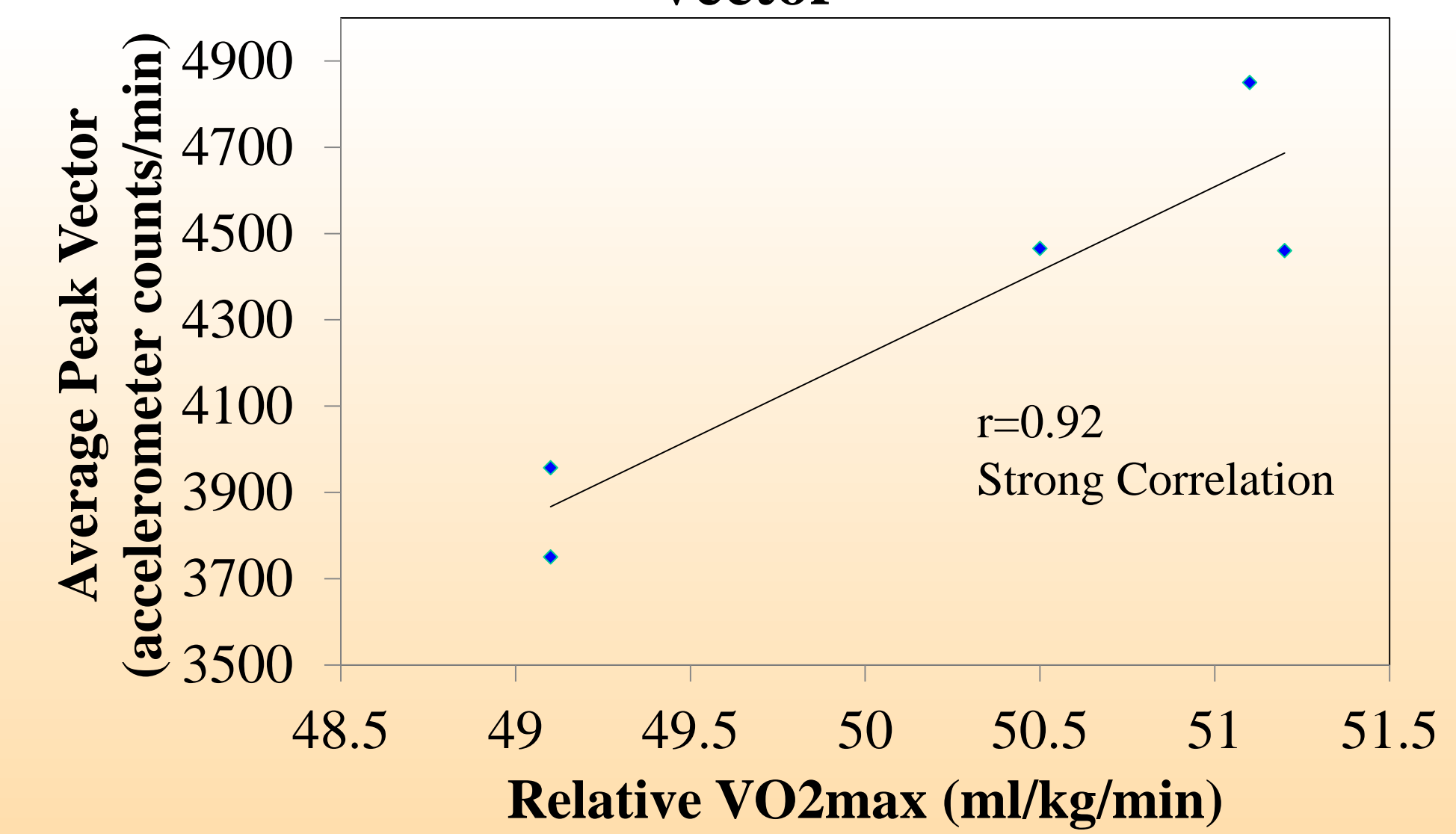
Variable	Value
Age (yrs)	20.2 ± 1.0
Height (in.)	73.6 ± 2.9
Weight (lbs.)	186.2 ± 13.7
Relative VO_{2max} (ml/kg/min)	50.2 ± 1.0
Abs. VO_{2max} (L/min)	4.2 ± 0.3
HRmax (bpm)	189.2 ± 5.0
RPE	17.8 ± 0.8
Max Kcal	147.8 ± 7.2
Time (minutes)	13.0 ± 0.7

Variable	Value
Kcals	254.2 ± 30.4
Total Time (minutes)	36 ± 6.3
Peak HR (bpm)	172.4 ± 5.6
Average HR (bpm)	141.6 ± 11.7
Peak Vector (accelerometer counts/min)	8205.4 ± 1748.0
Average Vector (accelerometer counts/min)	4296.4 ± 440.3

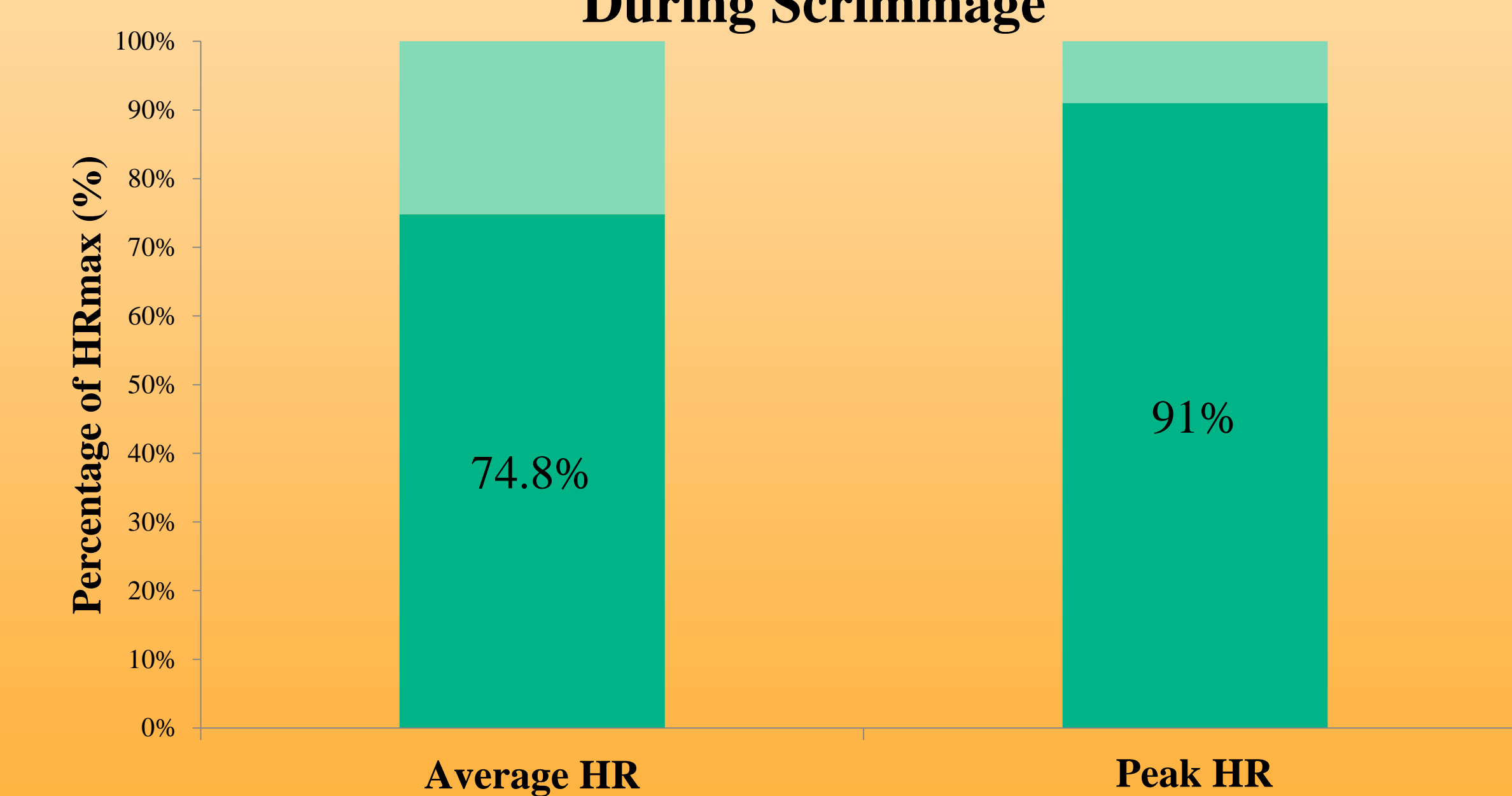
Graph 1: Comparison Between Relative VO_{2max} And Peak Vector Magnitude



Graph 2: Comparison Between Relative VO_{2max} And Average Peak Vector



Graph 3: Average And Peak HRmax Percentage During Scrimmage



Results

- Maximal aerobic treadmill test:
 - Maximal heart rate (MHR) 189.2 ± 5.0 bpm
 - RPE M: 17.8 ± 0.8
 - Relative VO_{2max} 50.2 ± 1.0 ml/kg/min
 - Kcal at max 147.8 ± 7.2 kcals
- Scrimmage:
 - Average HR- 74.8% HRmax
 - Peak HR- 91% HRmax
 - Significant correlations were found between the average vector magnitude and relative VO_{2max} ($r=0.92$) and also between the peak vector magnitude and relative VO_{2max} ($r=0.88$).

Conclusions

The results of this study indicate that those who compete in competitive sports maintain a high level of intensity even during practice.