

## The Effects of Weekly and Game-Day Weather Conditions on Soccer Game-Day Performance

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### ABSTRACT

Game-day performance may be influenced by factors such as training load management, hydration status, and environmental conditions at all levels of competition in soccer. However, there is currently a lack of literature examining the effects of weather conditions, prior to and during game-days, on game-day performance in soccer players. **PURPOSE:** To observe the effects of the 7-day average of weather conditions prior to game-day and average game-day weather conditions on game-day performance, more specifically heart rate (HR) and running velocity. **METHODS:** Twenty-one male semi-professional soccer players (mean  $\pm$  SD; age:  $22 \pm 2$  yr; mass:  $77.3 \pm 6.9$  kg) participated in this study. Ambient temperature, humidity, and wet-bulb globe temperature (WBGT) were collected using a Kestrel 5400 Heat Stress Meter before and after each training session and game. The average game-day temperature ( $GD_{TEMP}$ ), humidity ( $GD_{HUM}$ ), and WBGT ( $GD_{WBGT}$ ), along with the prior 7-day average temperature ( $7d_{TEMP}$ ), humidity ( $7d_{HUM}$ ), and WBGT ( $7d_{WBGT}$ ) were calculated and used for analysis. Each player wore a Polar Team Pro tracking device to monitor external and internal training load during each game. Game-day performance was defined as the percent change in average HR and velocity between the 1st and 2nd halves of each game. Stepwise linear regression analysis was performed to determine if weather condition metrics predicted game-day performance. **RESULTS:** Game-day weather conditions ( $GD_{TEMP}$  [ $27.71 \pm 3.78$  °C],  $GD_{HUM}$  [ $54.84 \pm 16.02$  %],  $GD_{WBGT}$  [ $21.32 \pm 3.83$  °C]) did not have any statistical significance in predicting game-day performance for both HR and velocity ( $p > .05$ ). Similarly, weather conditions one week prior to game day ( $7d_{TEMP}$  [ $26.41 \pm 3.22$  °C],  $7d_{HUM}$  [ $53.93 \pm 7.36$  %], and  $7d_{WBGT}$  [ $21.12 \pm 1.82$  °C]) did not have statistical significance in predicting game-day performance ( $p > .05$ ). **CONCLUSION:** Weather conditions one week before and during game-days do not significantly predict game-day performance, specifically the change in HR and velocity between the first and second halves. Furthermore, environmental conditions, more specifically heat stress, may not significantly affect training load metrics prior to and during game-days in soccer players due to potentially the lack of variabilities in environmental conditions; however, adequate hydration status and proper recovery strategies may have explained this lack of impact.