

## **Effects of Environmental Conditions, Core Temperature, and Hydration Status on Women's Soccer Performance**

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The purpose of this study was to determine how external load, hydration, core body temperature, perceived exertion, and WetBulb Globe Temperature (WBGT) affected GPS tracked performance of women's soccer players during preseason training. Members of an NCAA Division III women's soccer team ( $n=10$ ; age= $19.5\pm 1.4$  years, mass= $62.14\pm 5.01$  kg, height= $167.78\pm 7.65$  cm) volunteered to ingest thermistors (HQ Inc, Palmetto, FL) that measured core body temperature as well as wear Sport Performance Tracking (SPT, Melbourne, Australia) GPS units and heart rate monitors (Polar H9, Bethpage, NY) during all training sessions. The dependent variable was intensity (proprietary GPS composite score; AU). Independent variables included distance traveled (m), body mass change (kg), fluid consumption (kg), gastrointestinal temperature change (T<sub>gi</sub>), Training Load Session Ratings of Perceived Exertion (TL-sRPE), WBGT change (°C) (Kestrel® 5400 WBGT heat stress tracker), sleep data from the Karolinska Sleep Diary (KSD), and session duration (min), and maximum HR. TL-sRPE ( $P<.001$ ), body mass change ( $P<.001$ ), WBGT change ( $P=.010$ ), and maximum HR ( $P=.013$ ) explained approximately 53% of the variance in intensity ( $F_{4,82}=23.506$ ,  $P<.001$ ). The results of this study support the association between internal load, hydration status, and environmental conditions with external load. Proper rehydration should be encouraged while monitoring environmental conditions and internal load to minimize stress.