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Abstract

In professional soccer, competitive matches are played on a weekly basis throughout the season that usually lasts for a period of about ten months. In order to maximize the likelihood of achieving success in matches, players are required to maintain the capability to perform repeated high-intensity running throughout the season. To achieve this, the management of the external (prescribed) and internal (responses) training load during soccer training sessions is paramount so as to better assist coaches and sports scientists in the planning, evaluation, and adjustment of training. In addition, establishing the relationship of training load with the capability to perform repeated high-intensity running can provide practitioners with evidence-based understanding and the usefulness of training load indicators especially those that closely relate to physical performance in soccer.

To investigate this relationship, the research was conducted on a professional soccer club across four different phases of the season (mid, late, early in-season and pre-season). Laboratory test to determine soccer players' physiological profile was performed twice (mid in-season and pre-season). Field based tests of repeated high-intensity running capability, the YoYo Intermittent Recovery Test (YYIR 2) was conducted in all phases of the season while the repeated sprint ability (RSA) test was conducted at three phases of the season (early, mid in-season and pre-season). Training load data (global positioning system, heart rate and session rating of perceived exertion) and perceived rating of wellness were also collected across each phase. Results showed that there were similarities and differences in the relationship between training load variables and YYIR 2 performance. The results in phase 1 (mid in-season) showed that Lucia's TRIMP (TRIMP_L) and YYIR 2 was inversely correlated ($r = -.6$; $p = .04$). In phase 2 (late in-season), training load variables that were significantly correlated with

YYIR 2 ($r = .81; p < .01, r = .77; p = .01, r = .88; p < .01, r = .67; p = .03$) included total distance (TD), work-rate (WR), low-intensity distance (LID) and playerload (PL). In phase 3 (pre-season), apart from TD and WR, the training load variable MID was significantly correlated with YYIR 2 performance ($r = .65; p = .04, r = .80; p = .01, r = .83; p < .01$). There were also significant inverse correlations between PL with 10 and 20m sprint performances ($r = -.70; p = .04, r = -.61; p = .02$). In phase 4 (early in-season), TD, WR, LID and time spent in Lucia Zone 3 were significantly correlated with YYIR 2 performance ($r = .58; p = .04, r = .67; p = .01, r = .55; p = .04, r = .54; p = .04$). The findings showed that the relationship between training load and the capability to perform repeated high-intensity running was influenced by the phase of the season and choice of training load variables. The variation and the magnitude of the relationship displayed across the four different phases highlight the need to consider the types of ‘load’ and ‘intensity’ at different phases of the season in order to maximize performance. Practitioners should consider implementation of the identified training load variables within their monitoring practices and adopt a multi-dimensional approach in the management of training load in professional soccer players.