

**MITIGATING LOSS OF FITNESS DURING A COMPETITIVE NCAA DI MEN'S SOCCER SEASON:
THE EFFECT OF HIGH-SPEED RUNNING DISTANCE**

M. Duca¹, E. Espinoza^{1,2}, D. Fish^{1,3}, M.H. Stone¹

¹East Tennessee State University, ²Monterey Bay Football Club, ³Chicago White Sox

INTRODUCTION

Maintaining optimal physical fitness throughout a competitive NCAA Division I Soccer season presents a significant challenge. The **dense** fall competition **calendar**, exposing players to ~20 games in less than four months, leaves **little room for training**. Additionally, **varying training loads** experienced by starter (ST) and non-starter (NS) players can **lead to inefficient stimuli** on the players' physical capacities, potentially **impacting performance** and injury risk.

GOALS

1. Examine the **differences in training load** experienced by ST and NS players across multiple competitive seasons
2. Identify the **impact of the accrued training load on the player's physical capacities**.

METHODS

- **Retrospective** study design
- 26 NCAA division I **men's soccer players** (age=20.6±1.6 years, height=1.79±0.07 m, body-mass=77.5±6.4 kg)
- Data retrieved from the institution research repository for **two competitive seasons**.
- Players' **physical capacities** were **measured** as part of an ongoing monitoring program **at the beginning (PRE) and at the end (POST)** of the season.
- To evaluate **lower body power and strength**, Countermovement Jumps (CMJ) and isometric mid-thigh pulls (iMTP) were performed on dual force plates (Rice Lake Weighing Systems). **CMJ height (CMJh), CMJ peak power** and **iMTP peak force** were computed.
- **Soccer specific fitness** was assessed through the total distance covered in the **Yo-Yo Intermittent Recovery Level 1 test (Yo-YoIR1d)**.
- **Training load** was monitored with a **GPS system (Optimeye S5, Catapult Sports)** using the following key performance indicators (KPI): **duration, total distance (TD), player load (PL), High Speed Running Distance (HSRD), and Sprint Running Distance**.
- To assess the **effects of SEASON (#1, #2), USAGE (ST, NS)** on training load, multiple **two-way ANOVAs** have been computed.
- Additionally, for the **effects of SEASON and USAGE on the changes in physical capacities (PRE, POST)**, multiple **mixed-model ANOVAs** were conducted.
- The models were then **enhanced by including the KPIs as covariates**.
- If a covariate returned a significant effect, linear models were computed to predict the changes in physical capacity.

RESULTS

- For **CMJh**, a significant **TIME effect** ($p=0.022$, 0.36 ± 0.04 to 0.35 ± 0.05 m), and a significant **interaction TIME x SEASON x USAGE** ($p=0.010$) were detected.
- For **Yo-YoIR1d** was detected a **significant interaction TIME x SEASON** ($p<0.001$, #1 from 2.1 ± 0.2 to 1.8 ± 0.3 km, #2 from 1.7 ± 0.3 to 2.2 ± 0.4 km).
- For training load, a **USAGE effect** was **present for duration** ($p<0.001$, ST 394 ± 30 , NS 324 ± 38 min/week), **TD** ($p<0.001$, ST 31.4 ± 1.6 , NS 22.6 ± 3.6 km/week), **PL** ($p=0.001$, ST 3338 ± 491 , NS 2662 ± 373 au/week).
- **HSRD** was a **significant covariate** for **YoYoIRd** in the ANCOVA mixed model ($p=0.010$).
- The linear model including **HSRD** was a **significant predictor** of **Yo-YoIR1d** change ($p=0.049$, $HSRD=0.863$, $Intercept=-904.7$).

CONCLUSIONS

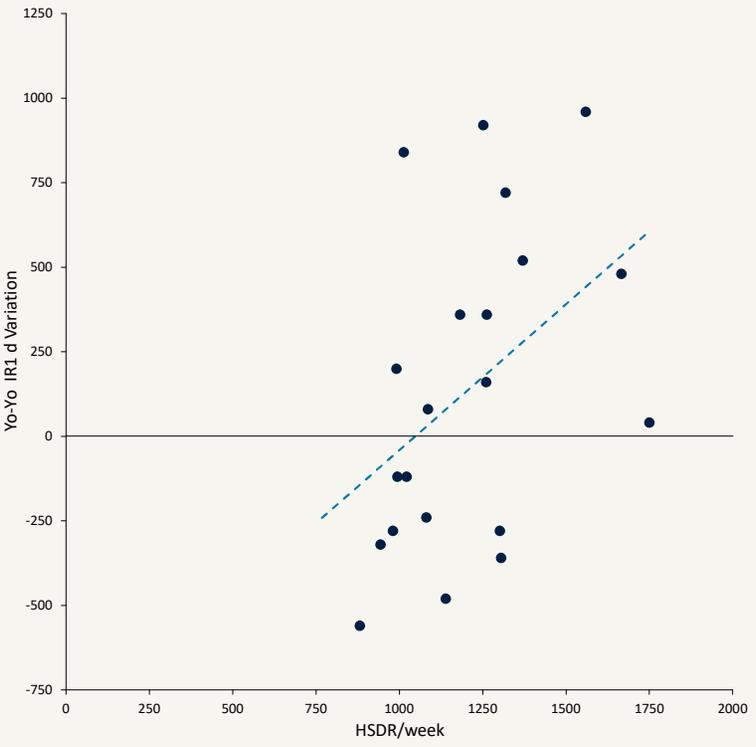
- ANOVA results indicated a **loss in CMJh** during a competitive season.
- Across two competitive seasons, Yo-YoIR1d performances showed varying trends across seasons.
- Although ST were exposed to additional duration, TD, and PL, **fitness loss was independent of player usage**. Instead, **changes in fitness are best explained by HSRD** covered during the season.

PRACTICAL APPLICATIONS

Coaching staff should **ensure adequate exposure to HSRD** for NCAA division I men's soccer players **to maintain physical fitness** characteristics required by the game. Supplementation for non-starters in the form of small-sided games and conditioning activities is warranted.

e-mail: ducam2@etsu.edu

HSDR exposure Improves Fitness During a NCAA DI Men's Soccer Season



In the scatter plot the relationship between Yo-Yo IR1 distance POST-PRE variation on the vertical axis and High Speed Distance Running (HSDR) reported as weekly average values on the horizontal axis is reported. HSDR is a significant predictor of YoYoIR1d change ($p=0.049$). A greater exposure to HSRD lead to improvements in YoYoIR1d



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