



Jayhawk
Athletic
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Laboratory

The Quantification of In-Season External Practice Loads in NCAA Division-1 American Football

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BACKGROUND

Practice sessions throughout a competitive season for American football players imposes high demands on the body to prepare athletes for competition (1). A typical week for NCAA Division-1 American football consists of 4 practice sessions. Previous literature has explored periodizing the volume, density and intensity of these practices to ensure the athlete is equipped to handle the demands of competition while also allowing for ample time to recover (2). This can be done via the usage of global positioning systems (GPS) and can be useful in ensuring practice demands are comparable of that to which occurs on gameday (3).

PURPOSE

The purpose of this study was to quantify practice demands that occur throughout a regular competitive season in NCAA Division I American football.

METHODS

External load metrics were collected via global positioning system (GPS) units for a total of 96 NCAA Division-I American football players during two regular competitive seasons (2023 and 2024) that each spanned a total of 12 and 13 weeks respectively. Data was sampled at a rate of 10 Hz (Vector T7, Catapult, USA). The day of practice (i.e. day 1, 2, 3 or 4) was the independent variable of interest. The main dependent variables of interest were PlayerLoad, total distance (yd), high speed distance (yd), contact load and total accelerations and decelerations.

INSTRUMENTATION



Catapult Vector T7 (USA)

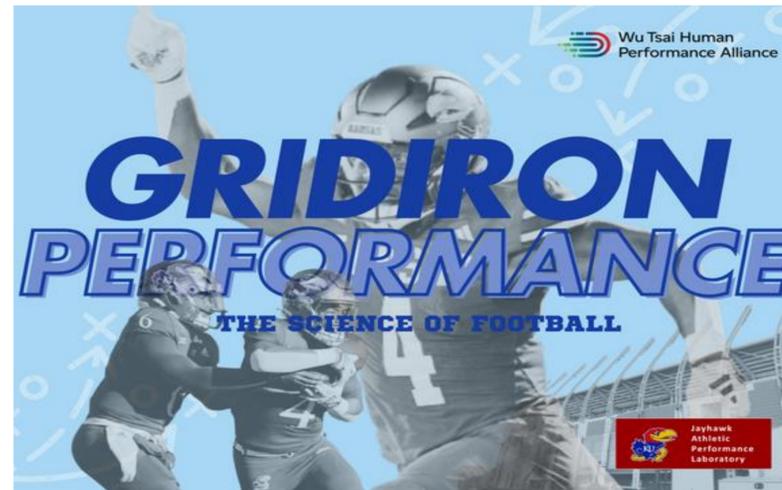
Sample Rate: 10Hz/s

STATISTICAL ANALYSIS

Descriptive statistics, including the mean and standard deviation for external load metrics were calculated. A one-way analysis of variance was utilized to determine differences between external load metrics between the four practice sessions.

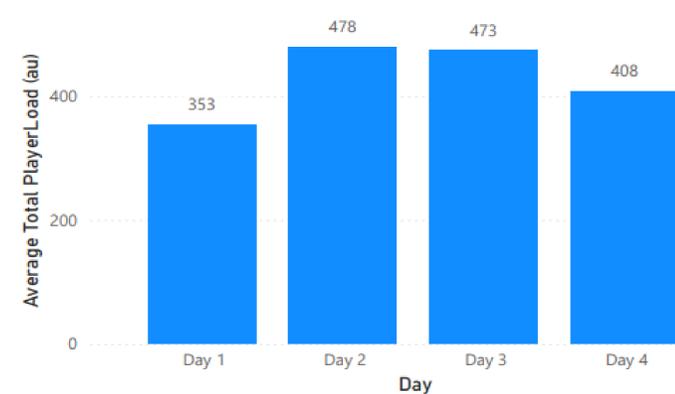
RESULTS

Total PlayerLoad ($p<0.001$), total distance ($p<0.001$), total accelerations and deceleration ($p<0.001$) and contact load ($p<0.001$) for day 1 and day 4 were significantly lower in comparison to day 2 and 3. Day 1 for high-speed distance was significantly lower than the three days after ($p<0.001$).

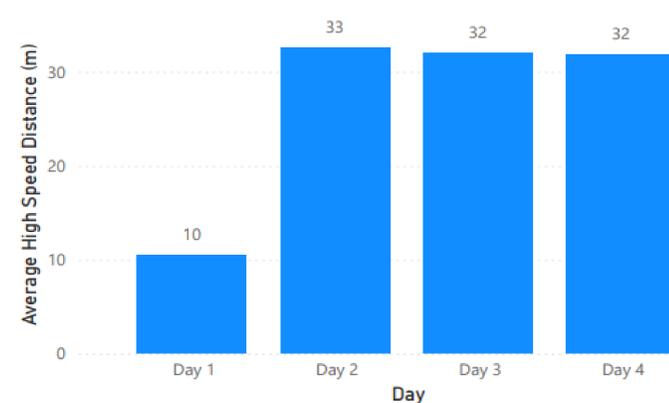


RESULTS

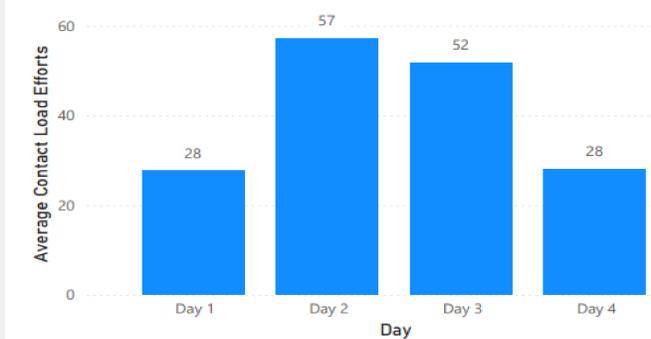
Average Total PlayerLoad (au) by Practice



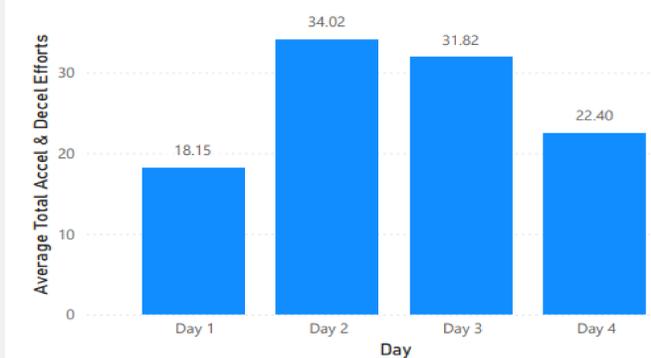
Average High Speed Distance (m) by Practice



Average Contact Load by Practice



Average Total Accelerations & Decelerations by Practice



CONCLUSION

Findings from this study suggest that external load metrics differ between practices throughout a normal week in preparation for competition. Furthermore, athletes accumulate higher loads during days 2 and 3 of practice in comparison to the first and last day.

PRACTICAL APPLICATIONS

Identifying high load practices can aid in a sport practitioner's ability to make decisions around performance enhancement programs and recovery modalities, as well as allow for the potential to periodize training loads.

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