

The Physical Demands of Professional Ultimate Frisbee

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ABSTRACT

Purpose: The purpose of this study was to investigate the physical demands of professional ultimate frisbee. Professional ultimate frisbee is defined as players who play in the Ultimate Frisbee Association (UFA). Physical demands that were measured include sprint distance, number of accelerations, decelerations, and top speed.

Methods: Three players participated in this study. Players were asked to wear STASport GPS trackers during their games to measure physical demands. Following each game, the data were sent to the research team. At the conclusion of the regular season, the data was summarized and stastically analyzed.

Results: Data from three players was collected and analyzed. Players averaged 46.3 ± 19.1 accelerations and 46.8 ± 13 decelerations per game. On average, a total distance of 6940.7 ± 1982.1 meters was covered per game, of which 591.5 ± 255.9 meters was high-speed running (HSR) (>5.5 m/s) and 1260.7 ± 437.3 meters were high-intensity distance (HSR, acceleration, and deceleration distance combined). The average max speed was 8.6 ± 0.5 m/s and on average 15.9 ± 9.8 sprints (number of times over 6.6 m/s) were completed per game.

Conclusions: The study displayed that the physical demands of male professional-level Ultimate Frisbee players are greater than previously reported data on collegiate and club-level players. This data may serve as a benchmark for future studies on professional-level UFA players.

Applications in Sport: Understanding the physical demands of the sport can better aid coaches and trainers in creating training programs that prepare athletes during the off-season and pre-season for the physical demands needed in-season. This information can also help sports medicine staff create better return to sport protocols.

METHODS & RESULTS

Methods

Participants ($n=3$) were all male players currently signed and part of an active roster on a UFA team. STATSports GPS Units was utilized to track the physical demand metrics during gameplay. GPS trackers were housed inside of a vest, directly between the shoulder blades, that is worn during gameplay.

Procedures

In June 2024, each player received a STATSports GPS tracker to monitor and record gameplay data via a mobile app, with standardized settings for consistency. During games, they recorded precise start, half-time, and end times to capture accurate data. Key metrics such as accelerations, decelerations, max speed, and total distance were submitted to secure Google Drive folders for analysis. Data collection continued until the UFA regular season ended on July 20th, 2024, after which trackers were returned and the data analyzed.

Results

Table 1: The external loads (mean \pm SD) encountered during professional Ultimate Frisbee

Variable	Subject 1	Subject 2	Subject 3	Cumulative
Number of Accelerations	49.2 ± 21.9	55 ± 4.2	29 ± 8.5	46.3 ± 19.1
Number of Decelerations	49.7 ± 11.3	54.5 ± 6.4	30.5 ± 12	46.8 ± 13
Max Speed (m/s)	8.7 ± 0.2	8.9 ± 0.2	8 ± 0.9	8.6 ± 0.5
Number of Sprints	12.8 ± 4.6	32.5 ± 2.1	8.5 ± 6.4	15.9 ± 9.8
Total Distance (m)	8190.5 ± 560.1	6525 ± 700	3607 ± 1163.9	6940.7 ± 1982.1
High-Speed Running (m)	685.2 ± 172.4	722.5 ± 88.4	179.5 ± 79.9	591.5 ± 255.9
High-Intensity Distance (m)	1479.8 ± 270.5	1318 ± 127.3	546 ± 149.9	1260.7 ± 437.3

SD = standard deviation. Number of Accelerations: Count of times accelerated $\geq 3m/s^2$. Number of Decelerations: Count of times decelerated $\geq -3m/s^2$. Number of sprints: Count of times speed of ≥ 6.6 m/s was reached. High-speed running: Distance at ≥ 5.5 m/s. High-intensity distance: High-speed running and distanced accelerated and decelerated combined.

Discussion

The primary goal of this study was to track the physical demands of professional-level male Ultimate Frisbee players. This was a first attempt to quantify the demands at the professional level. The study found that the average distance covered per game was 6940.7 ± 1982.1 meters, which is about 1.7 times greater than the previously reported average of 4092 ± 960 meters for elite-level male players. This discrepancy is even more apparent as professional games are shorter, consisting of four 12-minute quarters compared to the two 30-minute halves recorded in previous studies. Additionally, the study contrasts with previous research on competitive collegiate players, who covered an average distance of 4.70 ± 0.47 km over 54 minutes, highlighting the increased distance per unit of time at the professional level. This suggests that professional players accumulate significantly more distance per game.

However, the study also noted a lower average distance of high-speed running, at 591.5 ± 255.9 meters per game, compared to the 827 ± 275 meters reported in previous elite-level studies. This difference might stem from variations in the classification of "high-speed running," with previous studies defining it as running at or above 14 km/hr (approximately 3.89 m/s), while this study used a threshold of 5.5 m/s.

In conclusion, trainers, coaches, and players can utilize the data to create better informed off-season, pre-season, and in-season training programs. This preparation can help players handle the speeds, distances, and intensities required to excel in the sport and reduce the risk of injuries associated with fatigue or acute increases in workload. Additionally, this information could aid rehabilitation and healthcare professionals in creating return-to-sport protocols by establishing informed benchmarks to progress individuals back to the necessary physical demands for play.

