A Comparison of External Loads in Division III Men's Lacrosse Between High Competition Matches and Low Competition Matches

SEAN M. COLLINS, PATRICK M. MOORE, THOMAS G. BOWMAN, YASMINE I. JONES, PRICE BLAIR
UNIVERSITY OF LYNCHBURG

INTRODUCTION

- At the NCAA Division III level, there are 247 institutions that sponsor men's lacrosse as a varsity NCAA sport. Amongst these schools, there are a total of 8,901 student athletes participating in Division III men's lacrosse (4)
- The physiological demands of lacrosse vary from position to position, but as a whole, the sport of lacrosse requires varying degrees of endurance, strength, speed, power, and agility.
- Defense and Attack have been shown to have higher loads compared to other positions (3)
- Positional differences between positions may vary greatly depending on playing and substitution strategies (2).
- Competition levels have been shown to elicit significant changes in external loads with greater loads experienced during higher competition games (1).
- Division III teams vary in skill levels; most teams' schedules have a balance of high competition (HC) and low competition (LC) teams.
- Determining the effect of competition level on external loads in lacrosse between can help inform coaches and strength and conditioning coaches of differing needs across a season.

RESEARCH PURPOSE

The purpose was to determine the external load experienced by a NCAA Division III lacrosse team between two levels of competition in matches between positions.

METHODS

- 54 Male Division III lacrosse athletes consisting of 7 positions (Attack, Defense, Defensive Midfield (DM), Offensive Midfield (OM), Long stick Midfield (LSM), Face-off Midfield (FOM), and Goalie (G))
  - *age: 20.6±1.4 years, mass: 85.0±7.5 kg, height: 181.7±6.0 cm*
- SPT GameTraka GPS + Accelerometer devices were worn by each athlete in each competition (N =21).
- Device collected data from the time it was turned on until it was placed back in the hub at 10 Hz.
- Data downloaded and trimmed to game play only via GameTraka cloud software.
- Data was collected into a comprehensive Google Sheets spreadsheet and organized into the necessary columns and organized by competition classification and position.
- Competition were classified as High (n = 10) if the opponent qualified for the NCAA tournament or Low (n=11) if the opponent did not qualify for the NCAA tournament.
- Players were included in the GPS analysis if they played in ≥50% of the competition which resulted in primarily starters.
  - A total of 330 data points were collected (High = 153; Low = 177)
- Dependent variables were Total Distance (m), Intensity (AU), Work Rate (m/min), 2D Load (AU), and 3D Load (AU)

RESULTS

Table 1. Means and Standard Deviations of Dependent Variables by Position for all Competitions

	Total Distance (m)	Work Rate (m/min)	Intensity (AU)	2D Load (AU)	3D Load (AU)
Defense	5,756 ± 1,542	57.83 ± 15.36	18.36 ± 6.57	232.03 ± 62.78	353.15 ± 94.91
Attack	6,176 ± 1,533	61.46 ± 14.20	20.68 ± 6.78	259.90 ± 56.67	393.54 ± 87.61
Midfield					
Offensive (OM)	3,421 ± 1,195	33.89 ± 11.33	10.36 ± 5.55	159.76 ± 70.42	236.12 ± 104.70
Defensive (DM)	4,600 ± 1,080	45.66 ± 10.72	16.56 ± 5.42	216.62 ± 59.45	322.48 ± 88.51
Long Stick (LSM)	4,820 ± 1,859	48.12 ± 18.00	17.45 ± 9.38	252.21 ± 120.20	364.45 ± 159.61
Specialists					
Goaltender (G)	3,174 ± 578	31.56 ± 5.21	7.00 ± 1.76	139.09 ± 33.40	199.25 ± 47.98
Face-Off (FOM)	3,313 ± 763	32.91 ± 6.70	9.65 ± 4.08	175.57 ± 42.61	250.52 ± 63.26

Expected significant (p < 0.05) differences between positions, with Attack and Defense experiencing greater Total Distances, Work Rate, and Intensity compared to Midfield (OM, DM, LSM) and Specialists. LSM and DM reported significant differences compared to OM and Specialists in all dependent variables

When comparing positional differences between the classifications (HC vs LC), ONLY defense reported significant (p < 0.05) differences in Total Distance (m), Work Rate (m/min), 2D Load (AU), and 3D Load (AU), but not significantly different in Intensity. All other positions did not report significant (p > 0.05) differences between HC and LC and dependent variables

Defensive Differences
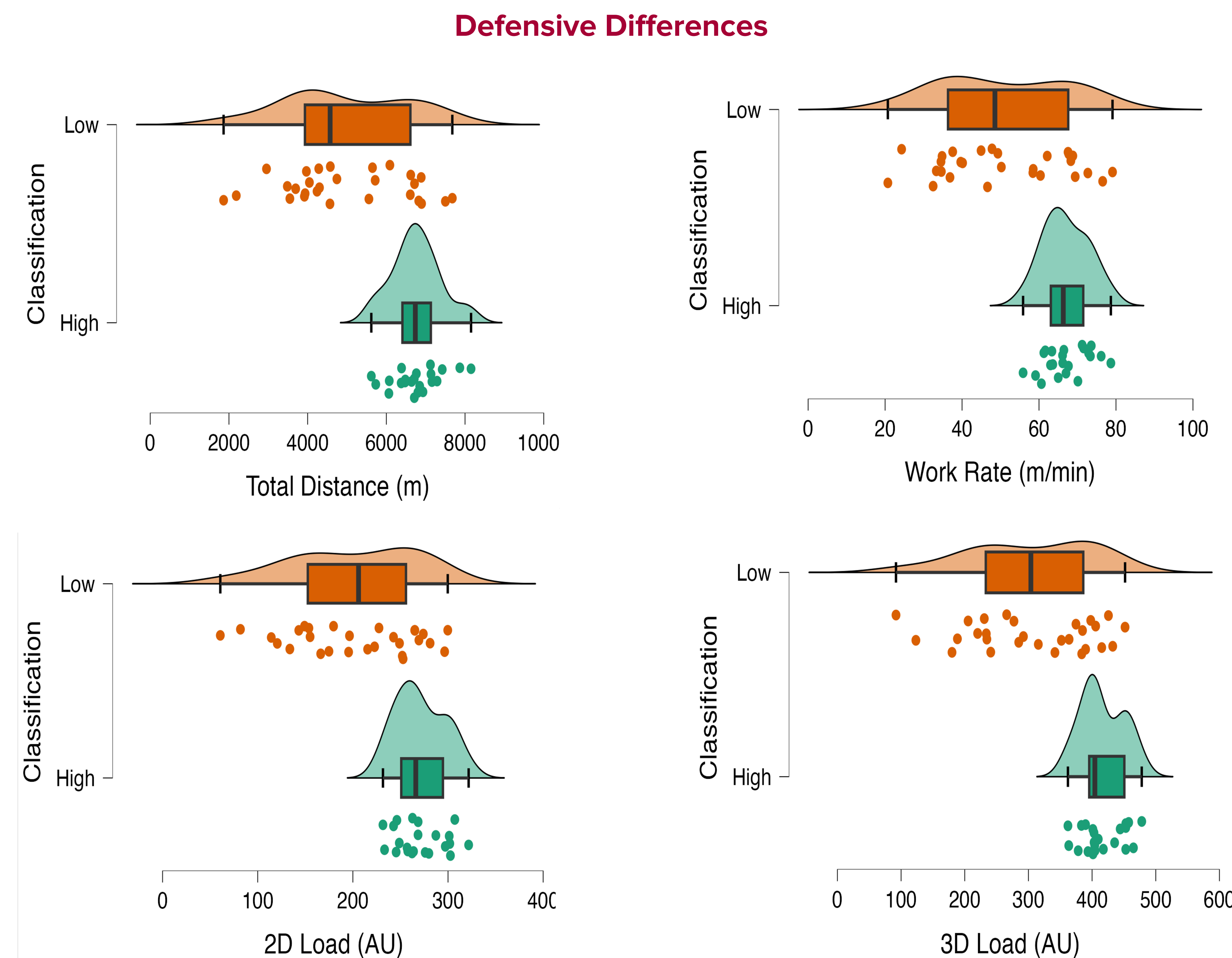
DISCUSSION

- While expected differences were found between positions overall, when compared to competition level, only defensive players saw significant differences in Total Distance, Work Rate, 2D Load, and 3D Load.
- HC elicited a greater load on defensive players compared to the LC.
- HC also resulted in a much lower variability in the dependent variables.
- The nature of playing defense is reactive; with increased load caused by reactions to offensive play
- HC may also result in more defensive possessions, that may last longer.
- LC matches result in more offensive possession and shorter defensive possessions, so less defense is played.
- A better method of stratification should be developed as competition at the Division III level is broadly varied in skill levels.

CONCLUSION

High competition levels result in an increased external load of defensive players but not others. Considering schedules, defensive players may need a greater degree of conditioning going into a season and more recovery periods after certain competitions.

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