

Comparative running demands of under 18, under 21 and senior regional field hockey tournaments



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Introduction

Hockey is an invasive team sport that incorporates offensive and defensive skills with intermittent high-speed running bouts (4). In New Zealand regional competitions are played in tournament format which may require teams to play six matches over a seven-day period. The limited recovery time during and the cumulative load of a tournament can affect match-play intensity (1). Research into the running demands of hockey players has increased in recent years due to the advances in global positioning systems (GPS) and motion analysis software (3). Research has primarily focused on the elite and international levels (2) with minimal investigation of New Zealand competitions. Therefore, the purpose of this investigation was to investigate and compare the tournament running demands of New Zealand under 18, under 21 and senior regional hockey tournaments.

Methods

Running demands of thirty male regional hockey players (n = 10, under 18; n = 10, under 21; n = 10, senior) during the 2019 open and age-group national tournaments. Athletes played six matches over a seven-day period during each respective tournament.

Total distance (TD), high-intensity running (HIR; distance $\geq 15\text{km.hr}$), low-intensity running (LIR; distance $\leq 14.9\text{km.hr}$), high-intensity acceleration (HI-ACC; acceleration $\geq 3\text{m.s}^{-2}$) and high-intensity deceleration (HI-DEC; deceleration $\geq 3\text{m.s}^{-2}$) were assessed global positioning system technology (VX350b Log, Visuallex Sport International Ltd., Lower Hutt, New Zealand).

To limit error, each participant wore the same unit for all matches and units were turned on 15 minutes prior to the pre-match warm-up to allow for the acquisition of a stable satellite signal (5).

Data was analysed in SPSS using analysis of variance (ANOVA) and post hoc Bonferroni correction ($p \leq 0.05$).

Key findings

Position-specific:

- Under 18 strikers and midfielders cover significantly higher HIR distance than under 21 strikers and midfielders.
- Senior midfielders cover significantly higher LIR Distance than under 18 and 21 midfielders, more HI-ACC efforts than under 21 midfielders and more HI-DEC than efforts than under 18 midfielders.
- Under 18 strikers had significantly less HI-ACC efforts than senior and under 21 strikers and less HI-DEC efforts than under 21 strikers.
- Senior defenders had significantly more HI-ACC efforts than under 18 defenders.

Age-group specific:

- Under 18 midfielders cover significantly higher TD and HIR than under 18 defenders and higher LIR and more HI-ACC efforts than under 18 strikers.
- Under 18 strikers cover significantly higher HIR than under 18 defenders.
- Senior midfielders cover significantly higher TD and LIR than senior strikers.

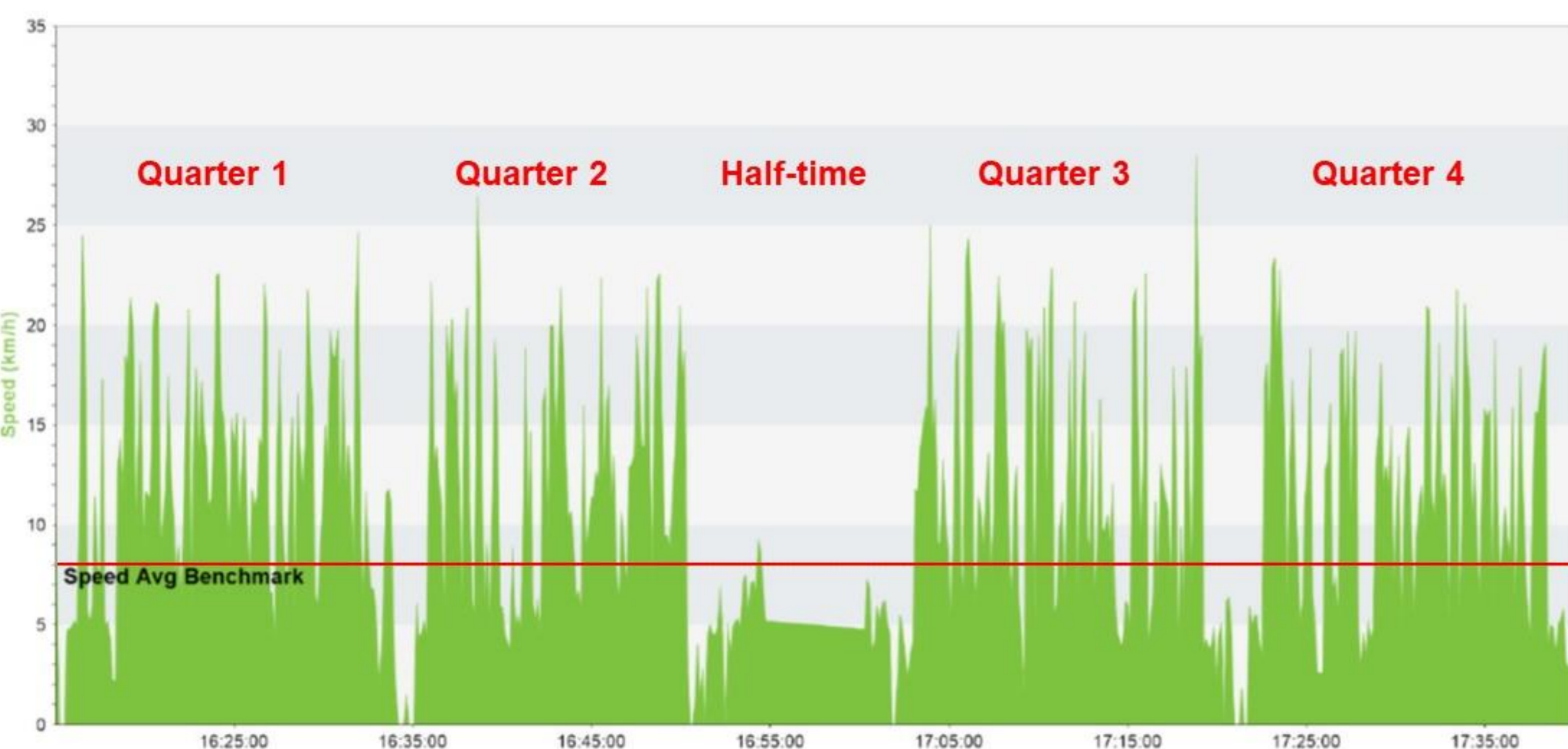


Figure 2: Example of the intermittent running demands of hockey match play. Figure generated in VXVIEW™

Table 1: Average match play running demands comparisons between age groups and playing positions

Age-group	Position	Total Distance (m)	High-intensity Running (m)	Low-intensity Running (m)
Under 18	Defender	5838.03 ± 1055.12	896.29 ± 373.71	4941.74 ± 930.53
	Midfielder	6548.47 ± 703.55 ^a	1501.56 ± 559.42 ^a	5046.91 ± 852.14
	Striker	6088.96 ± 1228.02	1839.79 ± 456.85 ^a	4249.17 ± 819.56 ^b
Under 21	Defender	6217.11 ± 452.58	768.33 ± 232.43 ^{b,c}	5448.78 ± 393.92 ^c
	Midfielder	6190.83 ± 525.90	1064.00 ± 432.69 ^{b,c}	5126.83 ± 376.24 ^c
	Striker	6421.75 ± 395.47	1211.08 ± 458.49 ^c	5210.67 ± 335.40
Senior	Defender	6080.10 ± 1378.31	836.85 ± 432.14 ^{b,c}	5243.25 ± 1205.60 ^c
	Midfielder	6808.00 ± 864.79 ^a	846.45 ± 340.08 ^{b,c}	5961.55 ± 964.05 ^{a,b,c,e}
	Striker	5821.61 ± 837.98 ^h	926.50 ± 424.05 ^{b,c}	4895.11 ± 905.10 ^h

Data presented as mean ± SD; Sig. ($p \leq 0.05$); ^aSignificantly different to u18 defender; ^bSignificantly different to u18 midfielder; ^cSignificantly different to u18 striker; ^dSignificantly different to u21 defender; ^eSignificantly different to u21 midfielder; ^fSignificantly different to u21 striker; ^gSignificantly different to senior defender; ^hSignificantly different to senior midfielder

Practical Implications

“The running demands of male regional field hockey players are age and position specific, therefore, training schedules and intra-match substitutions should be tailored according to playing level and position”

Tournament load

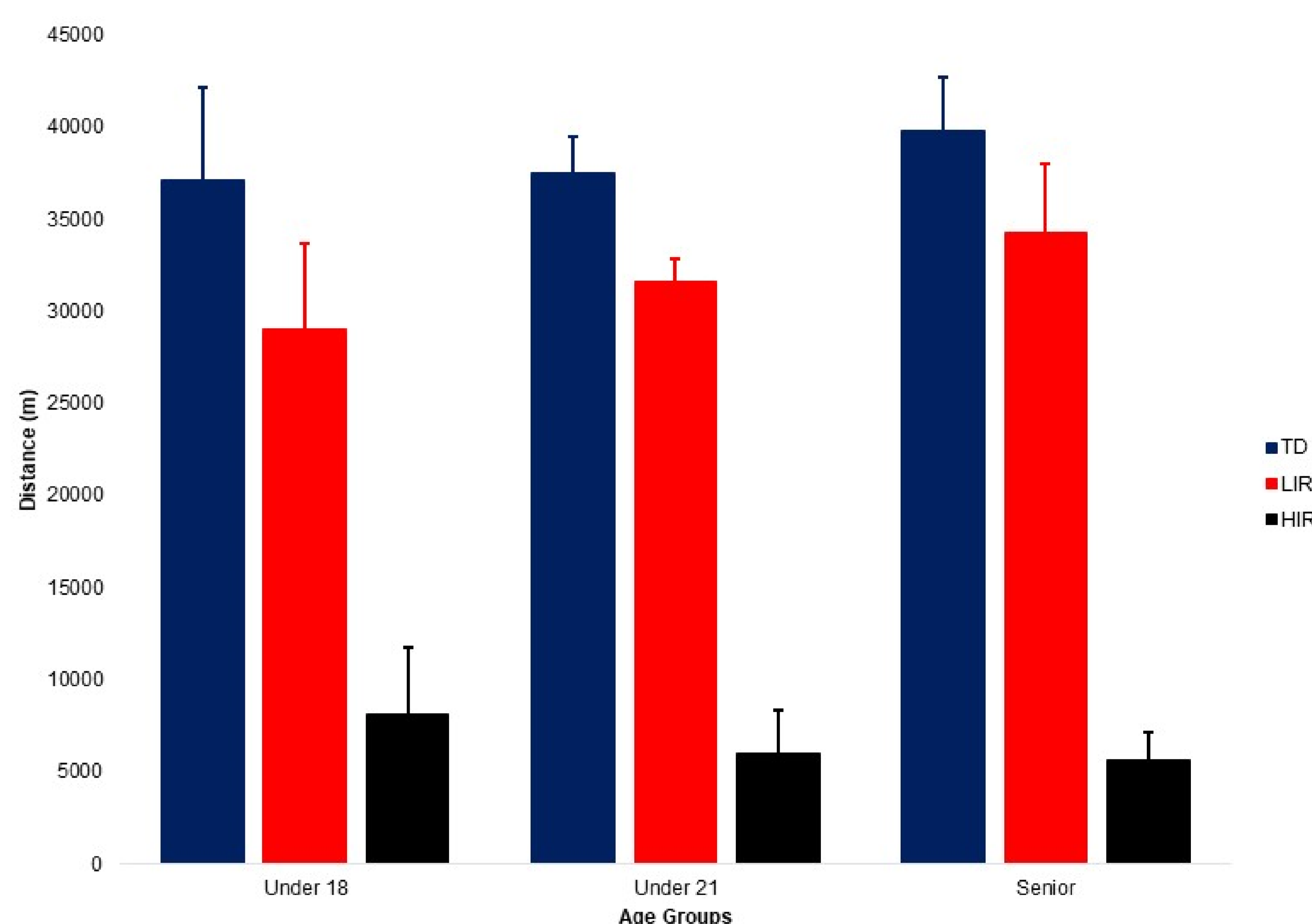


Figure 1: Comparison of total tournament Total Distance (TD), Low-intensity Running (LIR) and High-intensity Running between under 18, under 21 and senior field hockey age-groups

Future Research

- Combined video and GPS investigation into the effects of technical and tactical aspects on player running demands.
- Investigation into the influence of multiple matches in a short time-span on individual or position-specific running demands.
- Investigation into the different running demands between quarters of match-play.

References

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