RELATIONSHIPS BETWEEN COUNTERMOVEMENT JUMP FORCE-TIME METRICS AND SKATING SPEED IN COLLEGIATE HOCKEY ATHLETES

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Purpose

- Examine extent to which lower body force, velocity, power, and jump height during a countermovement jump (CMJ) are related to skating speeds in male and female collegiate ice hockey athletes

Methods

- Subjects: 26 male (age: 22.4 ± 1.2 years) and 22 female (age: 19.5 ± 1.0 years) NCAA Division III hockey athletes
- Included forwards (males: n = 16, females: n = 13) and defenders (males: n = 10, females: n = 9)
- Performed CMJs on a force plate that recorded ground reaction force (GRF) data
- CMJ variables: peak force, peak velocity, peak power, and jump height (based on flight time)
- Peak force and power normalized by body mass
- Also completed timed skating test where they skated from goal line to the opposite goal line as fast as possible; time converted to skating speed (Figure 1)
- Spearman's correlation to examine relationships between CMJ variables and skating speed for males and females
- Guidelines to assess strength of the relationships based on magnitude of the correlation coefficients (r values): 0.10-0.30 = weak, 0.30-0.50 = moderate, 0.50-0.70 = moderately strong, and >0.70 = strong
- 95% confidence intervals ($CI_{95\%}$) were also generated for the correlation coefficients

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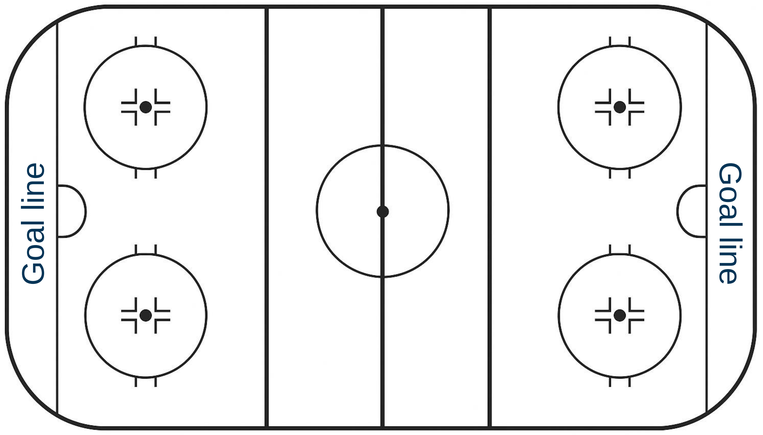

Figure 1. Rink diagram; skating speed calculated by dividing distance from goal line to opposite goal line by time (m/s)

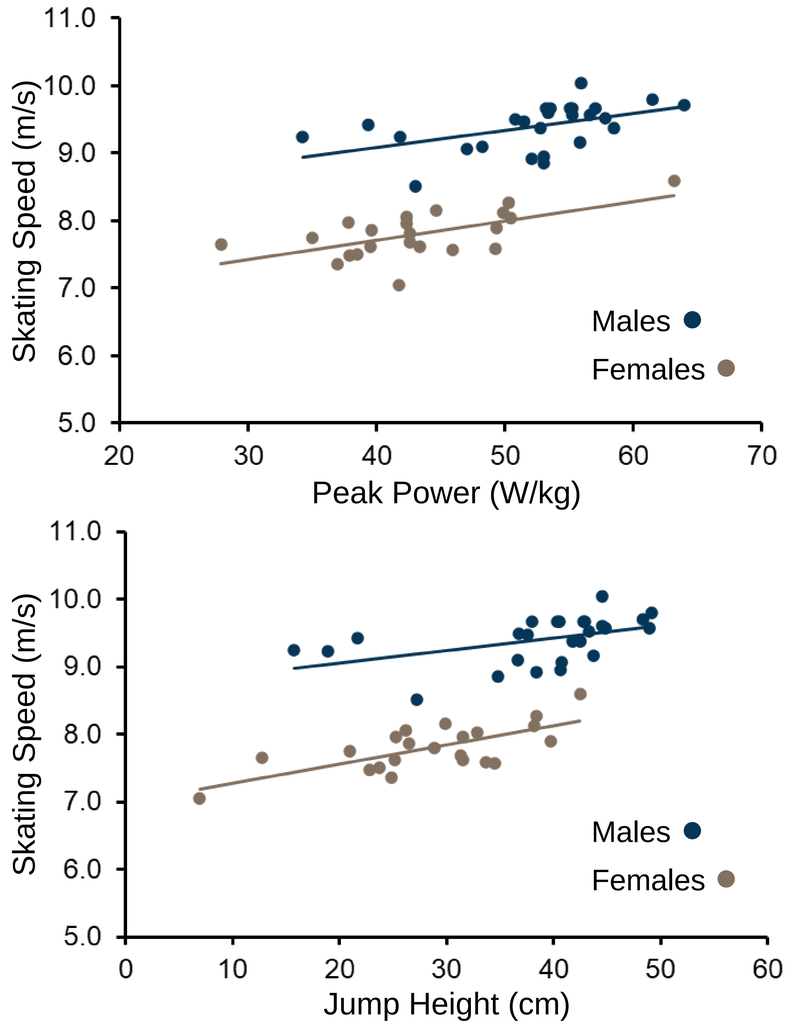

Figure 2. Scatter plots showing relationships between skating speed and peak power (top) and jump height (bottom)

Results

	Males (n = 26)	Females (n = 22)
Peak velocity	0.63* (0.29, 0.83)	0.53* (0.11, 0.79)
Peak force	0.16 (-0.25, 0.51)	0.27 (-0.18, 0.62)
Peak power	0.63* (0.29, 0.83)	0.54* (0.13, 0.80)
Jump height	0.58* (0.22, 0.80)	0.58* (0.17, 0.82)

Correlation coefficient and $CI_{95\%}$ (lower bound, upper bound) for skating speed and each CMJ variable
* Indicates significant relationship (based on $CI_{95\%}$)

- Figure 2 includes scatter plots showing relationships between skating speed and peak power/jump height

Conclusions

- Higher CMJ velocity, power, and jump height tended to correspond with faster skating speeds in both male and female collegiate hockey athletes
- Force production during the CMJ was not related to skating speed

Practical Applications

- Enhancing lower body power and movement velocity may be a key component for improving skating speed in male and female collegiate hockey athletes
- Our findings also indicate that jump height exhibits a moderately strong correlation with skating speed
- Jump height is easier to assess, since it can be measured without a force plate, making it a feasible for strength and conditioning coaches to monitor adaptations among collegiate hockey athletes

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