Physiological- and Socio-Cultural Conditions for Performance in Women’s Ice Hockey

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Akademisk avhandling

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Abstract

**Background:** The ice hockey community is founded on masculine norms and values, and the hockey rink is often described as “the home of men’s ice hockey”. Despite a growing popularity, women’s ice hockey has low priority in comparison to the men’s game. On top of that, the women’s game does not allow body checking, which makes it deviant from what some see as “the real game of ice hockey”. The checking prohibition causes physiological requirements to differ from the men’s game, and since women are underrepresented in ice hockey research, not much is known regarding the physiological- and socio-cultural conditions of women’s ice hockey. The overall aim of this doctoral thesis is to investigate physiological- and socio-cultural conditions important for performance in women’s ice hockey.

**Methods:** This thesis is unique in terms of the interdisciplinary approach between physiology and gender science, and the inclusion of studies based on both qualitative and quantitative research methods. Qualitative thematic interviews with ice hockey coaches from Sweden, Canada, and the United States were used to explore socio-cultural conditions in relation to performance and sport development (Paper I). Relative age effect (RAE) in relation to maturity status was examined through anthropometric measurements and a player questionnaire (Paper II). Physiological field- and laboratory assessments were used to investigate physiological conditions and performance in female competitive ice hockey players from Sweden (Paper III-IV), and players from Canada (Paper IV).

**Results:** The findings from Paper I suggest that coaches need to maintain a holistic approach to coaching to be able to coordinate and optimize the effects based on available conditions. Socio-cultural conditions, such as structural and financial support, are mentioned as important to support opportunities in women’s ice hockey. Furthermore, the results (Paper I) show that female players in Canada and the United States have superior opportunities compared to female players in Sweden. These advantages are mainly attributed to the support provided by the North American education systems. The findings from Paper II suggest that the relative age effect (RAEs) in women’s hockey are also influenced by socio-cultural conditions. Significant RAE (p<.05) was found for Swedish players born in the third quartile (Q3) and for Canadian player born in the second quartile (Q2). Players born in the fourth quartile (Q4) are significantly (p<.05) underrepresented in both countries. Players tend to be average or late maturers, but no differences can be found by country or position. The findings from Paper III show that field-based assessments are comparable to laboratory assessments with the purpose of predicting skating performance. The Prediction models accounted for 13.6 % to 42 % (laboratory-based models) and 24.4 to 66.3 % (field-based models) of the variance in skating time. Regardless of assessment method, uni-lateral assessments are superior to bi-lateral assessments. The results support the use of field-based assessments in Paper IV. The findings from Paper IV show various physiological profiles for female Swedish and Canadian players. Swedish players had less body fat (p=.007), more lean mass (p=.005), and greater aerobic fitness measured with the 20-meter shuttle run beep test (p<.001). Canadian players had greater maximal isometric leg strength (p=.026), exhibit a greater running acceleration (p=.001), performed better in single leg standing long jumps (right leg p=.002, left leg p=.030), and showed better anaerobic endurance (p=.029) on ice. No significant differences can be found between forwards and defenders. The findings from this study show that physiological- and socio-cultural conditions should both be considered in relation to performance in women’s ice hockey. For example, the various physiological profiles are probably an effect of the different socio-cultural conditions in Sweden and Canada. The Canadian profile may be better adapted to performance in ice hockey, but further research is needed to establish a relationship. Since women’s ice hockey often has somewhat limited resources, this knowledge may help optimize the effect of the available resources, and thus improve performance. Improved performance may have a positive long-term effect on the symbolic view of women’s ice hockey. Women can probably further optimize their physical performance in relation to their current conditions. But for permanent changes to occur, power structures in sport must also change. Women themselves have limited opportunities to affect the dominating gender norms and values in ice hockey.

**Conclusion:** The findings of this study show that physiological- and socio-cultural conditions should both be considered in relation to performance in women’s ice hockey. For example, the various physiological profiles are probably an effect of the different socio-cultural conditions in Sweden and Canada. The Canadian profile may be better adapted to performance in ice hockey, but further research is needed to establish a relationship. Since women’s ice hockey often has somewhat limited resources, this knowledge may help optimize the effect of the available resources, and thus improve performance. Improved performance may have a positive long-term effect on the symbolic view of women’s ice hockey. Women can probably further optimize their physical performance in relation to their current conditions. But for permanent changes to occur, power structures in sport must also change. Women themselves have limited opportunities to affect the dominating gender norms and values in ice hockey.

**Keywords**

Women’s ice hockey, female hockey players, positional characteristics, birth distribution, maturity status, exercise physiology, test methodology, sport, physiological characteristics.