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Effects of resisted sled push and sled pull training on sprint velocity in field hockey players

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INTRODUCTION:

During competition, field hockey players rarely reach their maximum velocity (V_{max}); therefore, the ability to accelerate becomes very important on short distances inferior to 15m (West et al., 2013). To improve the acceleration abilities, one training method is to add resistance while sprinting and commonly referred to as “resisted sprint” (Cahill, al., 2019). This resistance can be added by sled pulling (SPull) or sled pushing (SPush). Both training modalities leads to different technical adaptations. SPull and SPush positions are similar to the start and acceleration phases of a sprint, but SPush does not allow to use trunk and arms that have a great importance in the forward propulsion (Slawinski et al., 2022). The aim of this study is to compare the effect of SPull and SPush training methods on sprint times and individual force-velocity (F-v) profile’s factors.

METHODS:

Fifteen young national field hockey were split into two groups: SPull (8) and SPush (7) training. Each group performed 12 resisted sprint training session twice a week. Training protocol was divided into 3 phases: power, strength and velocity. Pre and post tests were composed of a F-v test (Fornasier-Santos et al., 2022) to measure the theoretical force (F_0), velocity (V_0) and maximal power (P_{max}). A 15m sprint with ball and cross test was also perform to measure field performance (P_{15m}). To compare effect of training, data were analyzed using a repeated measures ANOVA in complement of a post-hoc test when necessary.

RESULTS:

The results demonstrated that there was no interaction effect ($p > 0.05$), just a training effect for V_0 and F_0 . V_0 decrease following training (8.48 ± 0.48 vs 8.28 ± 0.47 m.s⁻¹; $p = 0.001$) and F_0 increase (7.3 ± 0.5 vs 7.7 ± 0.9 N.kg⁻¹; $p = 0.01$). Other parameters remained constant ($p = 0.05$).

CONCLUSION:

Both SPull and SPush allowed to improve F_0 and to break down V_0 . Contrary to our hypothesis the use of the arms and the trunk during sprint training seems to have no effect in the modification of the F-v profile. To conclude, SPull either SPush can be used to improve the acceleration phase in sprint running.

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