

Abstract

Title: The Influence of Selected Elements of Proprioceptive Neuromuscular Facilitation with the Use of Elastic Resistance on the Speed and Accuracy of Shooting of Extraliga Ball Hockey Players in the Czech Republic

Objectives: The main aim of the diploma thesis was to evaluate the influence of selected elements of proprioceptive neuromuscular facilitation with the use of elastic resistance on the speed and accuracy of shooting of Extraliga ball hockey players in the Czech Republic.

Methods: Extraliga ball hockey players in the Czech Republic ($n = 30$; age = $24,70 \pm 4,55$ years; body height = $182,67 \pm 6,12$ cm; weight = $83,35 \pm 9,17$ kg; BMI = $24,97 \pm 2,37$ kg/m²; overall years of ball hockey experience = $13,10 \pm 3,82$ years) were randomly divided into two groups – the experimental, PNF group ($n = 15$) and control group ($n = 15$). Before commencing the study, both groups' shooting speed was measured using the Supido Multi Sports Personal Speed Radar, and shooting accuracy using a practice sheet cover. Proband from the experimental group performed selected exercises containing elements of proprioceptive neuromuscular facilitation with elastic resistance daily for 8 weeks. The control group did not perform any exercises beyond the regular training units. The study was conducted at the time of the Covid-19 pandemic. Three weeks into the study, all sports activities of the team were interrupted and the probands therefore no longer performed any specific training. After 8 weeks, the shooting speed and accuracy were measured again. The results from the input and output measurements were analysed and compared in the statistical program R. In order to determine the distribution of data, the Shapiro-Wilk test of normality and the standardized Breusch-Pagan test of homoscedasticity of residues were used. The paired t-test and two-sample Welch's t-test were performed to compare the significance of differences, and a linear regression model was constructed at the significance level $\alpha = 0,05$. Cohen's d was used to assess clinical significance.

Results: In the PNF group, there was no statistically or clinically significant improvement in speed or accuracy of shooting, as well as no deterioration of shooting skills. In the control group, a statistically and clinically significant deterioration of shooting speed occurred. Shooting accuracy of the control group deteriorated as well, the value of effect size was at medium level, however, statistical significance was not confirmed. The results suggest that elements of PNF exercises with the use of elastic resistance could serve to prevent deterioration of shooting skills at a time when the individual cannot participate in the regular year-round training cycle.

Key words: ball hockey, shooting, wrist shot, shooting speed, shooting accuracy, proprioceptive neuromuscular facilitation, exercises with elastic resistance, sports training, physiotherapy