

The effect of static, proprioceptive neuromuscular fascilitation and dynamic stretching on the activation of hamstring muscle among preadolescence

Abstract

Flexibility of the hamstring muscle can enhance performance in sports through prevention of injury, muscular and postural imbalance, maintenance of full range of joint movement and optimal musculoskeletal function (Schuback, Hooper & Salisbury, 2004). Sullivan, Murray & Sainsbury (2009) stated that decreased hamstring flexibility was suggested to be one of the predisposing factors for hamstring strains and hamstring stretches were routinely used as part of an exercise routine. Purpose: The purpose of this study was to determine the more effective stretching method between static, PNF, and dynamic stretching on the activation of hamstring muscles among preadolescence and its relationship with power. Method: This research employed pre and post experimental design which comparing between and within subjects. Eighty subjects were assigned to four groups consist of static, PNF, dynamic and control group. Each participant exhibited tight hamstrings. Tight hamstrings were defined as a 30 degree knee extension deficit with the hip at 90 degree as described by Bandy et al (1997) & Gajdosik et al (1983). All of the participants was sedentary and not athletes. They were selected based on the low result from SEGAK (National Physical Fitness Standard). Each of the group followed six weeks intervention program except the control group. Outcome measures were measured using pre and post test. Statistical analyses used were mixed between-within subjects ANOVA and Pearson product moment correlation. Result & Discussion: Hamstring muscle activation following interventions with PNF was superior compared to other forms of stretching ($p < 0.05$). Sit and reach test, $F(3, 76) = 25.57$; $p < 0.05$, knee flexion test (dominant leg), $F(3, 76) = 17.414$; $p < 0.05$, knee flexion test (non dominant leg), $F(3, 76) = 22.264$; $p < 0.05$. Relationship between sit and reach test with vertical jump, $r = -0.435$, $p < 0.05$. Conclusion: PNF stretching was the effective treatment compared to static or dynamic stretching, however moderate and inverse relationship between flexibility and power.