

Acute Effects of Different Stretching Protocols Combined with Potentiating Exercise on Flexibility, Power, and Muscle Performance

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ABSTRACT

The purpose of this study was to investigate the acute effects of different stretching protocols combined with potentiating exercise on flexibility, power, and muscle performance. This study was conducted in repeated and cross-over designed. Thirteen collegiate males aged 25.4 ± 3.46 years voluntarily participated in this study. Prior to conduct stretching session, participants performed jogging on the treadmill for 5 min. Then, four different stretching protocols (non stretching; NS, static stretching; SS, dynamic stretching; DS, and proprioceptive neuromuscular facilitation stretching; PNFS) specially targeted for lower limb muscles combined with potentiating exercise (PE, 3 sets \times 5 times tuck jumps) were randomly applied at the same time of the day with 7-days interval. Straight leg raise, and vertical jump tests were measured at baseline, post jogging, stretching, and potentiating exercise. Isokinetic muscle strength, anaerobic power, and agility T-test were measured after each stretching combined with potentiating exercise. Repeated measure ANOVAs were used with significant level set at $p < .05$. Our results indicate that greater improvement in straight leg raise was observed in SS (9.6%) and PNFS (12.1%) compared to NS (0.6%) and DS (5.0%) at post stretching ($p < .001$). However, vertical jump performance was significantly improved only in DS (1.8%) ($p < .001$). After potentiating exercise, greater improvement of vertical jump performance was observed in NS (2.2%), SS (3.2%), and PNFS (6.5%) than DS (-0.4%) ($p < .01$). Isometric leg flexion was significantly higher in DS and PNFS than NS and SS after completion of PE ($p < .05$). However, no significant differences in leg extension, anaerobic power, and agility were observed among trials. Our study demonstrated that dynamic and PNF stretching protocols combined with potentiating exercise are efficient for generating muscle strength as well as improving flexibility. It is also noted that potentiating exercise plays a major role for preventing the acute loss of power induced by static and PNF stretching.