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**THE EFFECTS OF PROPRIOCEPTIVE NEUROMUSCULAR
FACILITATION (PNF) VERSUS STATIC STRETCHING ON
HAMSTRING FLEXIBILITY AS WARM-UP PROTOCOL**

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Research Project submitted in partial fulfilment of the requirement for the
degree of **Bachelor of Sports Science (Hons.)**

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AUTHOR'S DECLARATION

I declare that the work in this research project was carried out in accordance with the regulation of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicate or acknowledge as referenced work. This research project has not been submitted to any academic institution or non- academic institution for any degree or qualification.

I, hereby, acknowledgement that have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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THE EFFECT OF PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION (PNF) STRETCHING VERSUS STATIC STRETCHING ON HAMSTRING FLEXIBILITY

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Abstract

Flexibility can reduce risk of injuries and increase an athlete's performance in sports. Stretching were used as warm-up to increase flexibility or pain-free range of motion (ROM) and provide more power, increase the blood flow, stability balance and facilitate coordinated movement. However, there was lack of evidence that all athletes need flexibility to improve sport performance. The intention of this study was to investigate the effectiveness of proprioceptive neuromuscular facilitation (PNF) versus static stretching (SS) stretching on hamstring flexibility as warm-up protocol. Fifteen male recreational athletes were recruited (age = 20.0 ± 0.6 years old; weight = 69.9 ± 10.5 kg; height = 170.8 ± 3.9 cm; body mass index = 20.5 ± 2.9 kg.m⁻²; heart rate = 76.0 ± 4.8 bpm; body temperature = 37.2 ± 0.1 °C). This study was a repeated-measures study design consists of different stretching technique as exposures. Participants exposed to three exposures; proprioceptive neuromuscular facilitation (PNF), static stretching (SS) and control group (C) of pre warm-up in randomised order. Participants performed a general warm-up of 5 minutes jogging at self-pace followed by stretching exposure and proceed to sit and reach test and physiological measurement. Participants underwent 72 hours recovery period before the next exposure. The data was analysed by using one-way ANOVA with repeated-measures. As results, hamstring flexibility had improved significantly ($p < 0.0001$) PNF 26.4% and SS 12.74% when compared to control. There is significant differences when compared PNF and SS 12.1% ($p < 0.0001$) and for physiological measurement had significant differences ($p < 0.0001$) in HR 15.03% and body temperature 0.73% when compared before and after stretching. In conclusion, this study found that PNF and SS as warm-up able to improve hamstring flexibility with PNF having superior effect on hamstring flexibility.

Keywords: *pre warm-up, range of motion, physiological performance.*

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