

Perbandingan efektivitas peregangan statik dan peregangan proprioceptive neuromuscular facilitation terhadap outcome latihan penguatan isotonik otot kuadrisep dan hamstring pada pasien osteoarthritis lutut = The comparison of the effectiveness between static stretching and proprioceptive neuromuscular facilitation stretching to the outcome of isotonic strengthening exercise of quadriceps and hamstring muscle in knee osteoarthritis patient

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Abstrak

**LATAR BELAKANG:** Sendi lutut adalah sendi yang paling sering terkena OA. Stabilitas dinamik sendi lutut dipengaruhi oleh otot-otot kuadrisep dan hamstring. Untuk mengoptimalkan gaya yang dihasilkan oleh otot, program latihan peregangan harus terintegrasi dalam program latihan penguatan pada OA. Namun, belum ada penelitian yang membandingkan efek berbagai teknik peregangan terhadap hasil latihan isotonik pada pasien OA lutut. Tujuan penelitian ini adalah untuk mengetahui apakah terdapat perbedaan efek teknik peregangan statik dibandingkan Proprioceptive Neuromuscular Facilitation PNF terhadap outcome visual analog scale VAS, lingkup gerak sendi LGS, kekuatan otot, dan kemampuan berjalan latihan penguatan isotonik otot kuadrisep dan hamstring pada pasien OA lutut.

**METODE:** Desain penelitian ini adalah quasi experimental. Populasi terjangkau adalah wanita penderita OA lutut berusia 50 ndash; 70 tahun yang berobat ke Poliklinik Rehabilitasi Medik RSUPN Cipto Mangunkusumo Jakarta yang memenuhi kriteria penelitian. Pengambilan sampel dilakukan secara consecutive sampling dan dibagi menjadi dua kelompok secara randomisasi. Pada kelompok pertama, subjek diberi infra red radiation IRR, latihan peregangan statik, dan latihan isotonik otot kuadrisep dan hamstring. Pada kelompok kedua, subjek diberi IRR, latihan peregangan PNF, dan latihan isotonik otot kuadrisep dan hamstring. Intervensi dilakukan selama 6 minggu. Penilaian nyeri menggunakan skor VAS, LGS menggunakan goniometer, kekuatan otot menggunakan hand held dynamometer, dan kemampuan berjalan menggunakan uji jalan 15 meter.

**HASIL:** Sebanyak 30 responden mengikuti program latihan sampai selesai, kelompok pertama dan kedua masing-masing 15 orang. Setelah 6 minggu, didapatkan perbaikan skor VAS, LGS, kekuatan otot kuadrisep dan hamstring serta uji jalan 15 meter dengan perbaikan bermakna didapatkan pada kekuatan otot hamstring pada kedua kelompok. Delta skor VAS dan uji jalan 15 meter lebih tinggi pada kelompok peregangan statik dibandingkan PNF tetapi tidak berbeda bermakna. Delta kekuatan otot kuadrisep didapatkan lebih tinggi pada kelompok peregangan statik dibandingkan PNF dan berbeda bermakna  $p=0.033$ . Delta LGS dan kekuatan hamstring lebih tinggi pada kelompok peregangan PNF dibandingkan statik tetapi tidak berbeda bermakna.

**KESIMPULAN:** Pemberian latihan peregangan statik maupun PNF tidak memberikan efek yang berbeda bermakna secara keseluruhan terhadap outcome latihan penguatan isotonik otot kuadrisep dan hamstring pada pasien OA lutut.

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**BACKGROUND.** Knee joints are the joints most commonly affected by OA. The dynamic stability of the

knee joint is affected by the quadriceps and hamstring muscles. Stretching exercise programs should be integrated into strengthening exercise programs in OA to optimize the force that generated by the muscle. However, there have been no studies comparing the effects of various stretching techniques on the outcome of isotonic exercise in knee OA patients. The aim of this study was to find out whether there is a difference between the effect of static stretching compared to the Proprioceptive Neuromuscular Facilitation PNF to the outcomes visual analog scale VAS, range of motion ROM, muscle strength, and walking ability of quadriceps and hamstring muscle isotonic strengthening exercises in knee OA patients.

**METHODS.** The design of this study was quasi experimental. The study population is women suffering from knee OA aged 50-70 years who went to the Medical Rehabilitation Clinic RSUPN Cipto Mangunkusumo Jakarta that meet the criteria of the study. Sampling was done using consecutive sampling and divided into two groups by randomization. In the first group, subjects were given infra red radiation IRR, static stretching exercises, and isotonic exercises of quadriceps and hamstring muscles. In the second group, subjects were given IRR, PNF stretching exercises, and isotonic exercises of quadriceps and hamstring muscles. Intervention is done for 6 weeks. Pain assessment using VAS scores, ROM measurement using a goniometer, muscle strength measurement using a hand-held dynamometer, and walking ability measurement using a 50-feet walking test.

**RESULTS.** Thirty respondents were completed the exercise program, the first and second group consists of 15 people, respectively. After 6 weeks, the improvement of VAS, ROM, quadriceps and hamstring muscle strength and 50 feet walking test with significant improvement was obtained only hamstring muscle strength in both groups. Delta VAS scores and 50 feet walking test were higher in the static stretching group than PNF but not significantly different. Delta quadriceps muscle strength was significantly higher in the static stretch group than in PNF  $p = 0.033$ . Delta ROM and hamstring muscle strength were higher in the PNF stretching group than in static but not significantly different.

**CONCLUSIONS.** There is no significant difference between the effect of static stretching techniques and the PNF on the outcomes visual analog scale VAS, range of motion ROM, muscle strength, and walking ability of quadriceps and hamstring muscle isotonic strengthening exercises in knee OA patients.