

ABSTRAK

PENGARUH LATIHAN MODIFIKASI VLADIMIR JANDA (KESEIMBANGAN DAN PEREGANGAN OTOT TUNGKAI BAWAH) TERHADAP NYERI AKIBAT KERJA PEMETIK DAUN TEH

Latar belakang: Gangguan pada sistem otot rangka/*musculoskeletal disorders* (MSDs) merupakan masalah dalam bidang kesehatan kerja pada saat ini. Pemetik daun teh melakukan pekerjaan secara berulang dan terus menerus serta memerlukan energi dan kekuatan otot yang besar. Posisi menggendong beban berat daun teh pada punggung dan jalan yang cukup berbahaya terkadang menimbulkan masalah bagi pemetik daun teh. Rehabilitasi muskuloskeletal dapat meningkatkan kemampuan fungsi tubuh seseorang dengan baik. Salah satu program rehabilitasi muskuloskeletal adalah diberikannya terapi berupa latihan fisik. **Tujuan:** Mengkaji pengaruh kombinasi latihan keseimbangan dan peregangan otot tungkai bawah terhadap aspek kinerja pemetik daun teh. **Metode:** Desain penelitian yang digunakan adalah *quasi-experimental* dengan rancangan *randomized control group pretest-posttest design*. Subjek penelitian adalah pemetik daun teh yang terdiri dari 10 kontrol dan 10 perlakuan latihan keseimbangan metode Vladimir Janda dan 10 perlakuan kombinasi latihan keseimbangan dan peregangan otot tungkai bawah. Kombinasi latihan keseimbangan dan peregangan otot tungkai bawah dilakukan selama 12 minggu yang terdiri dari 5 fase. Fase I-IV dilaksanakan 5 kali seminggu, sedangkan fase V dilakukan 3 kali seminggu dan tiap sesi berdurasi 16 menit. *Postural sway* diukur dengan posturometer. Kekuatan otot tungkai diukur dengan *back-leg dynamometer*. Nyeri akibat kerja menggunakan kuesioner *Nordic Body Map*. Rentang gerak sendi diukur dengan goniometer. Cedera otot diukur dengan kadar serum IL-6. Uji statistik yang digunakan adalah *one-way ANOVA*. **Hasil:** *Postural sway* ($12,9 \pm 2,7$ detik; $p=0,00$), otot fleksor plantar ($3,3 \pm 2$ kg; $p=0,01$), rentang gerak sendi ekstrimitas bawah ((panggul fleksi ($118,2 \pm 1,98$ derajat; $p=0,00$); panggul ekstensi ($20,5 \pm 3,6$ derajat; $p=0,00$); lutut fleksi ($128,7 \pm 1,8$ derajat; $p=0,00$); lutut ekstensi ($6,2 \pm 2,1$ derajat; $p=0,029$); kaki fleksi ($14 \pm 2,1$ derajat; $p=0,05$); kaki ekstensi ($43,5 \pm 2,4$ derajat; $p=0,020$)) dan kadar serum IL-6 ($0,11 \pm 0,02$ mg/dl; $p<0,05$) di uji menggunakan *Kruskal Wallis* dan di *post-hoc Mann Whitney* didapatkan $p<0,05$ yang berarti bahwa kombinasi latihan keseimbangan dan peregangan otot tungkai bawah berpengaruh terhadap *postural sway*, kekuatan otot fleksor plantar, rentang gerak sendi ekstrimitas bawah dan kadar serum IL-6. Kekuatan otot ekstensor lutut diuji menggunakan *one-way ANOVA* dan di *post-hoc LSD* didapatkan ($69,6 \pm 15,6$ kg; $p=0,00$). Frekuensi nyeri akibat kerja berdasarkan NBM tungkai bawah berkurang pada lutut kanan dan kiri kelompok perlakuan A (11,7%). **Kesimpulan:** Penelitian ini merupakan penelitian pertama yang menghasilkan suatu kombinasi latihan keseimbangan dan peregangan otot tungkai bawah yang menurunkan *postural sway* dan meningkatkan kekuatan otot ekstensor lutut serta kekuatan otot fleksor plantar.

Kata kunci: *postural sway*, kekuatan otot, nyeri, latihan.

ABSTRACT

THE EFFECT OF VLADIMIR JANDA MODIFICATION EXERCISES (BALANCE AND STRETCHING LOWER LEG MUSCLES) ON WORK-RELATED MUSCULOSKELETAL DISORDERS OF TEA LEAF PICKERS

Background: Musculoskeletal disorders (MSDs) are a problem in the occupational health sector at this time. Tea leaf pickers carry out work repeatedly and continuously and require a lot of energy and muscle strength. The position of carrying a heavy load of tea leaves on the back and the dangerous road sometimes cause problems for tea leaf pickers. Musculoskeletal rehabilitation can improve a person's ability to function properly. One of the musculoskeletal rehabilitation programs is providing therapy in the form of physical exercise. **Objective:** Assess the effect of the combination of balance training and leg muscle stretching on the performance aspects of tea leaf pickers. **Methods:** The study design used was quasi-experimental with a randomized control group design pretest-posttest design. The research subjects were tea leaf pickers consisting of 10 control groups and 10 treatment groups for Vladimir Janda exercise and 10 treatment groups combination of balance exercise and stretching of muscle leg. The combination of balance and muscle strength exercises is carried out for 12 weeks consisting of 5 phases. Phase I-IV is carried out 5 times a week, while phase V is carried out 3 times a week and each session was 16 minutes. Postural sway is measured by posturometer. Work-related musculoskeletal disorders is measured by Nordic Body Map. The strength of the leg muscles was measured by a back-leg dynamometer. The range of motion of the joints is measured by a goniometer. Muscle injury is measured by IL-6 serum. The statistical test used was one-way ANOVA test. **Results:** Postural sway (12.9 ± 2.7 seconds; $p=0.00$), flexor plantar muscles (3.3 ± 2 kg; $p=0.01$), lower extremity joint range of motion ((hip flexion (118.2 ± 1.98 degrees; $p=0.00$); hip extension (20.5 ± 3.6 degrees; $p=0.00$); knee flexion (128.7 ± 1.8 degrees; $p=0.00$); knee extension (6.2 ± 2.1 degrees; $p=0.029$); foot flexion (14 ± 2.1 degrees; $p=0.05$); foot extension (43.5 ± 2.4 degrees; $p=0.020$)) and serum IL-6 levels (0.11 ± 0.02 mg/dl; $p<0.05$) were tested using Kruskal Wallis and in the post-hoc Mann Whitney test it was found that $p<0.05$ which means that the combination of balance training and stretching the lower limb muscles affects postural sway, plantar flexor muscle strength, lower limb joint range of motion and serum IL-6 levels. Knee extensor muscle strength was tested using one-way ANOVA and post-hoc LSD was obtained (69.6 ± 15.6 kg; $p=0.00$). The frequency of work-related musculoskeletal disorders based on NBM of the lower limbs was reduced in the right and left knees of treatment group A (11.7%). **Conclusion:** This study is the first research to produce a combination of balance training and lower leg muscle stretching which reduces postural sway and increases knee extensor muscle strength and plantar flexor muscle strength.

Keywords: postural sway, muscle strength, disorder, exercises.