

RINGKASAN

**PERBANDINGAN LATIHAN *LEG - PRESS* INTENSITAS TINGGI
METODE SEDANG DAN CEPAT TERHADAP KEKUATAN DAN
DAYA TAHAN OTOT TUNGKAI**

TAUFIQ HIDAYAT

Kekuatan dan daya tahan otot tungkai merupakan suatu komponen yang sangat menentukan dalam olahraga prestasi. Banyak faktor yang mempengaruhi kekuatan dan daya tahan otot tungkai antara lain latihan *leg press* dengan intensitas tinggi (80 % maksimum) metode sedang dan cepat.

Penelitian ini dilakukan dengan tujuan untuk mengetahui perbedaan dari hasil latihan *leg press* intensitas tinggi metode sedang dan cepat terhadap kekuatan dan daya tahan otot tungkai.

Rancangan penelitian yang digunakan adalah “*The Pretest – Posttest Control Group Design*”. Sampel yang dipilih adalah mahasiswa UNESA Fakultas Ilmu Keolahragaan usia antara 19-23 tahun, sehat dan tidak didapatkan kontra indikasi terhadap latihan fisik. Sampel dibagi menjadi 3 kelompok yaitu kelompok kontrol (K_0), kelompok intensitas tinggi metode sedang (K_1) dan cepat (K_2). Ketiga kelompok ini, 2 kelompok (K_1 dan K_2) diberi perlakuan yaitu latihan *leg press*.

Variabel bebas pada penelitian ini adalah latihan *leg press* intensitas tinggi metode sedang dan cepat, masing-masing kelompok melakukan latihan selama 6 minggu dengan frekwensi 3 kali tiap minggu. Setiap kali latihan terdiri dari 15 kali repetisi tiap set dengan jumlah 5 set. Latihan 5 set dalam interval sedang artinya waktu kerja 30 detik dan waktu istirahat 60 detik, sedangkan untuk interval cepat artinya waktu kerja 30 detik dan waktu istirahat 90 detik.

Variabel tergantung yang diukur adalah kekuatan dan daya tahan otot tungkai. Kekuatan otot tungkai bisa diukur melalui test *vertical jump* dengan menggunakan alat *Vertikal Jump MD* diperoleh hasil selisih tinggi lompatan (D). Kekuatan adalah hasil konversi dari selisih tinggi lompatan dengan rumus $P = \sqrt{4,9 \cdot W \cdot \sqrt{D}}$ dalam satuan kg m/s. Daya tahan otot tungkai bisa diukur melalui test *leg press* dengan ketahanan sekian lama (kali) sampai sampel mengalami kelelahan maksimum (tidak kuat lagi).

Kekuatan dan daya tahan otot tungkai dapat diambil saat sebelum latihan (*pretest*), 24 jam sesudah latihan tahap I selama 3 minggu (*posttest 1*) dan 24 jam sesudah latihan tahap II (*posttest 2*).

Data hasil pengukuran diolah dengan menggunakan statistik deskriptif dan statistik inferensial (uji normalitas distribusi, uji homogenitas varian, uji t berpasangan (*paired t-test*), uji multi variate, dan LSD) dengan taraf signifikansi 5 % ($\alpha = 0,05$).

Hasil uji t berpasangan (*paired t-test*) terhadap variabel kekuatan otot tungkai *pretest* dan *posttest* memberikan hasil bahwa : (1) Tidak ada perbedaan yang bermakna antara *pretest* dengan *posttest 1* ($p = 0,159$) dan *posttest 1* dengan *posttest 2* ($p = 0,065$) pada kelompok K_0 , (2) Ada perbedaan yang bermakna antara

pretest dengan *posttest 1* ($p = 0,000$) dan *posttest 1* dengan *posttest 2* ($p = 0,004$) pada kelompok K_1 . (3) Ada perbedaan yang bermakna antara *pretest* dengan *posttest 1* ($p = 0,001$) dan *posttest 1* dengan *posttest 2* ($p = 0,000$) pada kelompok K_2 . Hasil uji beda terhadap respon kekuatan antara K_1 dan K_2 diperoleh $p = 0,224$ artinya tidak ada beda yang bermakna, tetapi nilai respon K_1 lebih besar daripada K_2 ($25,867 > 21,167$). Sehingga dapat disimpulkan bahwa kekuatan intensitas 80 % maksimum metode sedang lebih meningkat daripada cepat meskipun perbedaan tersebut tidak bermakna.

Hasil uji t berpasangan (*paired t-test*) terhadap variabel daya tahan otot tungkai *pretest* dan *posttest* memberikan hasil bahwa : (1) Tidak ada perbedaan yang bermakna antara *pretest* dengan *posttest 1* ($p = 0,368$) dan *posttest 1* dengan *posttest 2* ($p = 0,068$) pada kelompok K_0 , (2) Ada perbedaan yang bermakna antara *pretest* dengan *posttest 1* ($p = 0,002$) dan *posttest 1* dengan *posttest 2* ($p = 0,000$) pada kelompok K_1 , (3) Ada perbedaan yang bermakna antara *pretest* dengan *posttest 1* ($p = 0,000$) dan *posttest 1* dengan *posttest 2* ($p = 0,000$) pada kelompok K_2 . Hasil uji beda terhadap respon daya tahan antara K_1 dan K_2 diperoleh $p = 0,000$ artinya ada beda yang bermakna, dimana respon K_1 lebih besar daripada K_2 ($37,500 : 13,667$). Sehingga dapat disimpulkan bahwa kekuatan intensitas 80 % maksimum metode sedang lebih meningkat daripada cepat.

Kesimpulan pada penelitian ini adalah : (1) latihan *leg press* intensitas tinggi (80 % maksimum) metode sedang dapat meningkatkan kekuatan dan daya tahan otot tungkai, (2) latihan *leg press* intensitas tinggi (80 % maksimum) metode cepat dapat meningkatkan kekuatan dan daya tahan otot tungkai, (3) latihan *leg press* intensitas tinggi (80 % maksimum) metode sedang lebih meningkatkan daya tahan otot tungkai daripada metode cepat.

SUMMARY

THE COMPARARATION BETWEEN THE INFLUENCE OF LEG - PRESS HIGH INTENSITY METHOD SEDANG AND CEPAT ON EXPLOSIVE POWER AND ENDURANCE OF LEG MUSCLE

TAUFIQ HIDAYAT

Power and endurance of leg muscle are components that play determining role in elite sports. A number of factors affect the explosive power and endurance of leg muscle, such as leg press high intensity exercise (80 % maximum) method middle and fast. The objective of this study was to identify the difference between the influence of high intensity leg press method middle and fast on explosive power and endurance of leg muscle.

This study used the pretest-posttest control group design. Samples were students of the Faculty of Sports, UNESA, aged 14-23 years, healthy, without contraindications to physical exercise. Samples were divided into three groups, i.e., control (K_0), group with high intensity middle (K_1) and fast (K_2). From these three groups, two (K_1 and K_2) received treatment, leg press exercise.

The independent variables in this study were leg press high intensity method middle and fast. Each group conducted exercise for 6 weeks with frequency of 3 times a week. Each training comprised 15 repetitions in each set, with totally 5 sets. Five sets training in interval comprised 15 repetitions in each set, with totally 5 sets. Five sets training in interval of middle indicated 30 seconds working time and 60 seconds resting time, while interval fast indicated 30 seconds working time and 40 seconds resting time.

The dependent variables were power and endurance of leg-muscle. The power of leg muscle can be measured by vertical jump test using Vertical Jump MD instrument, from which the difference (D) of the height of jump can be defined. Explosive power was the result of conversion of the difference of high jump using the formula : $P = \sqrt{4,9} \cdot W \cdot \sqrt{D}$ in kg m/s. Leg muscle endurance can be measured using leg press test with endurance for several times until the sample reached maximum fatigue.

Data on power and endurance of leg muscle were taken before exercise (pretest), 24 hour after exercise I for 3 weeks (posttest 1) and 24 hours after exercise II (posttest 2). Data were processed using descriptive and inferential statistics (normality distribution test, variant homogeneity test, paired t-test, multivariate test, and LSD) with significance level 5 % ($\alpha = 0,05$).

The results of paired t-tests on the variables of leg muscle power in pretest and posttest revealed that (1) There was no significant difference ($p = 0,159$) between pretest with posttest 1 and between posttest 1 and posttest 2 ($p = 0,065$) in group K_0 , (2) there was significant difference ($p = 0,000$) between pretest with posttest 1 and between posttest 1 with posttest 2 ($p = 0,004$) in group K_1 , (3) there was significant difference ($p = 0,001$) between pretest with posttest 1 and between posttest 1 with posttest 2 ($p = 0,000$) in group K_2 . The results of discriminate test between K_1 and K_2 revealed $p = 0,0224$, indicating no significant difference. But

value of power *respon* of K_1 great than K_2 ($25,867 > 21,167$). Conclusively, the power intensity of 80 % maximum using method middle resulted in more increase than that using method fast, although no significant different.

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The conclusions of this study were as follows : (1) leg press high intensity exercise (80 % maximum) method middle can increase power and endurance of leg muscle, (2) leg press high intensity exercise (80 % maximum) method fast can increase power and endurance of leg muscle, (3) leg press high intensity exercise (80 % maximum) method 1: 2 increases leg muscle endurance higher than method fast, (4) leg press high intensity exercise (80 % maximum) method middle increases leg muscle power higher than method fast.

ABSTRACT

THE COMPARARATION BETWEEN THE INFLUENCE OF LEG PRESS HIGH INTENSITY METHOD MIDDLE AND FAST ON EXPLOSIVE POWER AND ENDURANCE OF LEG MUSCLE

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Keywords : power, endurance, leg press high intensity method middle and fast