

PENGARUH POLIMORFISME GEN ACTN3 TERHADAP PERUBAHAN KETAHANAN OTOT PASCA INTERVENSI *PLYOMETRIC TRAINING* : Studi pada Mahasiswa Anggota Unit Kegiatan Mahasiswa (UKM) Olahraga Fakultas Kedokteran Universitas Jenderal Soedirman

ABSTRAK

Latar Belakang. Gen ACTN3 berpotensi menjadi kunci performa atletik individu dengan mengkode protein α -actinin-3 pada serat otot tipe cepat, sehingga menjadi marker genetik yang paling sering diteliti. *Plyometric training* (PT) adalah latihan yang dirancang untuk memperbaiki kinerja diri dengan memasukkan beberapa kegiatan dasar yang salah satunya untuk menilai ketahanan otot.

Tujuan. Penelitian ini bertujuan untuk mengetahui pengaruh polimorfisme gen ACTN3 terhadap perubahan ketahanan otot pasca intervensi *plyometric training* pada mahasiswa UKM olahraga Fakultas Kedokteran Universitas Jenderal Soedirman.

Metode. Penelitian ini menggunakan metode kuasi eksperimental dengan *pre test* dan *post test design* tanpa kontrol. Sebanyak 31 orang laki-laki dipilih dengan metode *consecutive sampling*. Subjek dikelompokkan berdasarkan polimorfisme gen ACTN3 menjalani tahapan penelitian berupa pengukuran ketahanan otot sebelum PT dan setelah PT. Responden mengikuti latihan PT selama 5 minggu dengan 2 sesi setiap minggunya. Pengukuran ketahanan otot dilakukan dengan gerakan *half squat jump* selama 1 menit.

Hasil. Uji T berpasangan menunjukkan perbedaan bermakna antara ketahanan otot sebelum dan sesudah intervensi PT. Hasil uji *One - Way ANOVA* menunjukkan tidak terpat perbedaan bermakna antara polimorfisme gen ACTN3 dengan perubahan ketahanan otot ($p > 0,05$).

Kesimpulan. Polimorfisme gen ACTN3 tidak berpengaruh terhadap perubahan ketahanan otot pasca intervensi *plyometric training* pada mahasiswa UKM olahraga Fakultas Kedokteran Universitas Jenderal Soedirman.

Kata kunci : Gen ACTN3, Ketahanan Otot *Plyometric Training*, Polimorfisme

**EFFECT OF ACTN3 GENE POLYMORPHISM ON MUSCLE ENDURANCE
CHANGES AFTER PLYOMETRIC TRAINING INTERVENTION**
*Study on Student of Sport Activity Unit (SAU) of Medical Faculty Jenderal
Soedirman University*

ABSTRACT

Background: *The ACTN3 gene has the potential to be the key to individual athletic performance by encoding the α -actinin-3 protein in fast type muscle fibers, making it the most frequently investigated genetic marker. Plyometric training (PT) is an exercise design to improve self-performance by incorporating several basic activities, one of which is to assess muscle endurance.*

Objective: *This study aimed to determine the effect of ACTN3 gene polymorphism on muscle endurance changed after PT interventions on student of SAU in Faculty of Medicine, Jenderal Soedirman University.*

Method: *A quasi-experimental method was conducted without control using pretest and posttest design. A total of 31 male students were selected by using consecutive sampling technique. Subjects were grouped based on ACTN3 gene polymorphisms and underwent two stages of muscle endurance measurements which were taken before and after PT interventions. Subjects attended 2 sessions of PT each week for 5 consecutive weeks. Muscle endurance is measured for a minute by doing half squat jumps.*

Results: *The result of pair T-test shows significant difference between muscle endurance before and after plyometric training. The result of One-Way ANOVA test shows that there is no significant difference of the ACTN3 gene polymorphism on muscle endurance changes after plyometric training intervention ($p > 0,05$)*

Conclusions: *The ACTN3 gene polymorphism doesn't affect the muscle endurance changes after PT interventions on student of SAU in Faculty of Medicine, Jenderal Soedirman University.*

Keywords: *ACTN3 gene, muscle endurance, plyometric training, polymorphism.*